



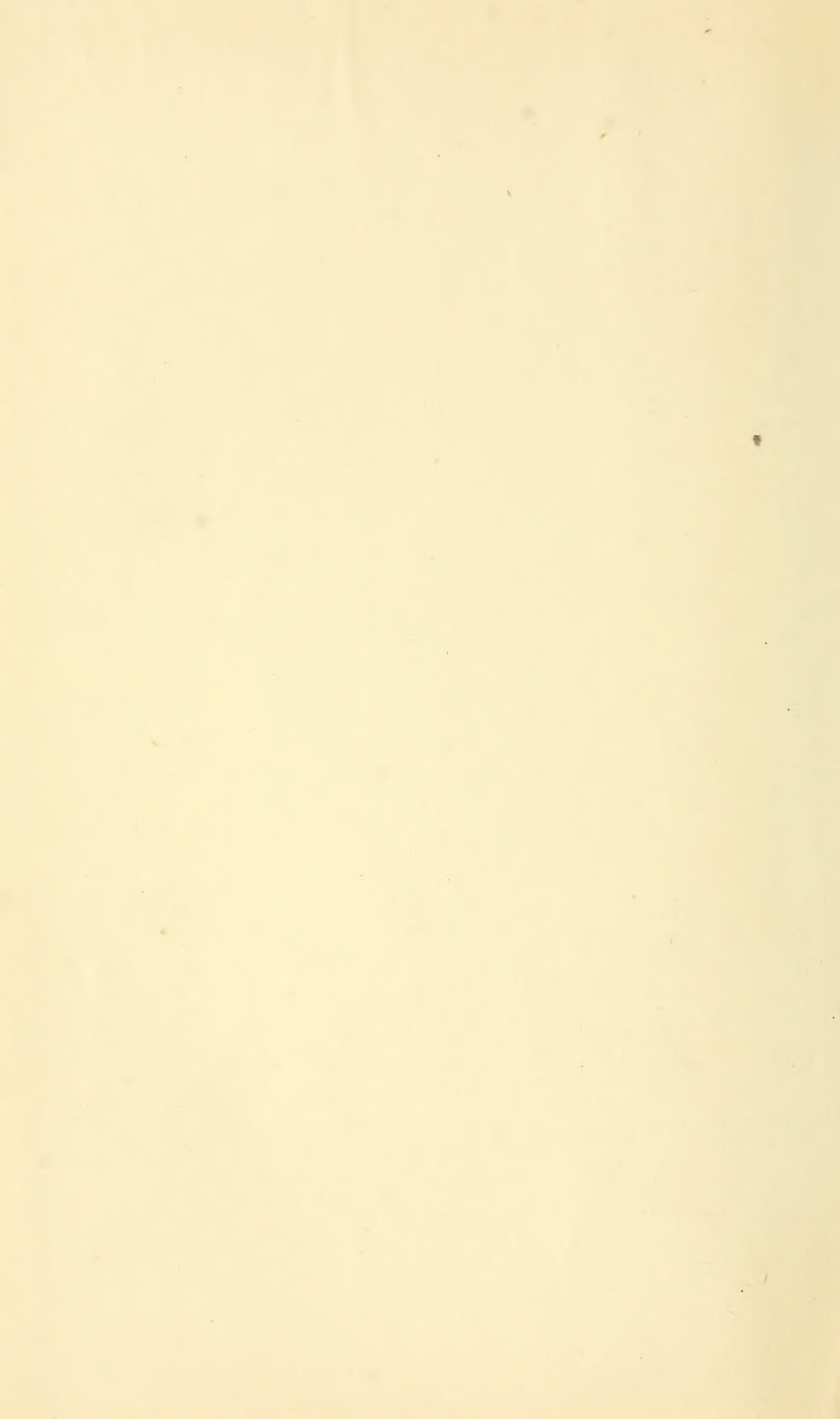


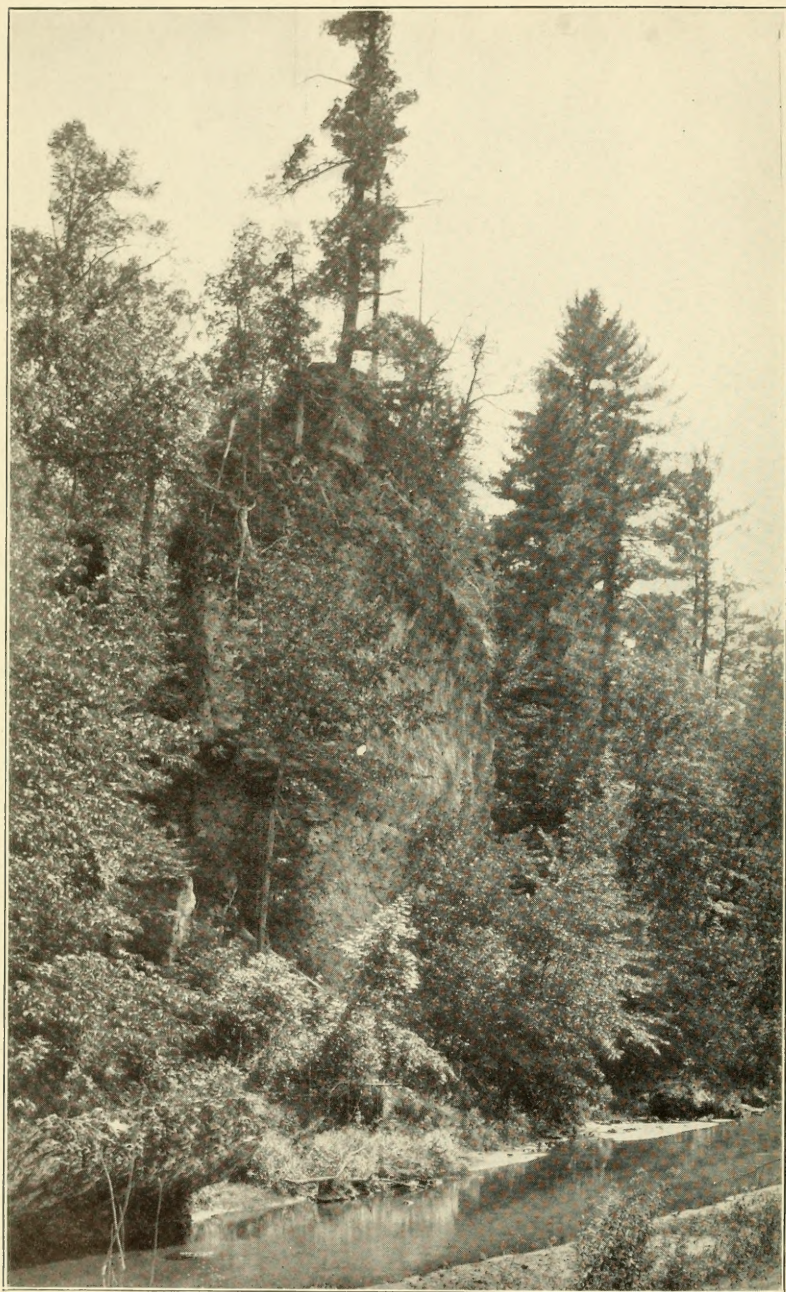
Class SB 482

Book I 8 A 5

1920

Copy 2





Steamboat Rock, Hardin County.

State of Iowa

1919

IOWA PARKS

Conservation of Iowa
Historic, Scenic and
Scientific Areas.

Also a Description of Numerous Areas Suitable for Public State
Parks, with Reasons for Their Preservation.

Report of the

Iowa STATE BOARD OF CONSERVATION.

Published by
THE STATE OF IOWA
Des Moines

Copy 2

SB482
I8A5
1920
copy 2

N. of D.
JUN 24 1920

31

96.11.11/27/20

THE IOWA STATE BOARD OF CONSERVATION,

L. H. Pammel, Ames,
J. F. Ford, Fort Dodge,
Joseph Kelso, Bellevue,
E. R. Harlan, Des Moines.

LIST OF ILLUSTRATIONS

County	SCENERY	Group after page
Allamakee.....	Balsam Fir.....	224
"	Islands in Mississippi River.....	192
"	Mississippi River near Lansing.....	192
"	Mississippi River and Steamboat.....	192
"	Waterville Park and Stream.....	192
"	Waterville Park and Bluff.....	128
"	White Pines and Birch.....	224
"	Yellow River.....	160
Boone.....	Entrance to the Ledges.....	192
Bremer.....	Waverly Park.....	64
Buena Vista.....	Little Sioux River at Sioux Rapids.....	96
Calhoun.....	North Twin Lake.....	192
Cerro Gordo.....	Clear Lake Shore.....	64
Clay.....	Little Sioux River at Peterson.....	192
Clayton.....	Balanced Rock, Bixby Park.....	160
"	Paradise Valley, Bixby Park.....	224
Delaware.....	Crags in Devil's Backbone Park.....	192
"	Devil's Backbone Park.....	128
Dickinson.....	Sunset on Lake Okoboji.....	128
Dubuque.....	Limestone Towers, Catfish Creek.....	64
Floyd.....	Big Boulder in southeast part of County.....	96
Hamilton.....	Little Wall Lake.....	192
Hardin.....	Iowa River Gorge, Iowa Falls.....	64
"	Steamboat Rock.....	Frontispiece
Jackson.....	Moorehead Caves near Maquoketa.....	224
"	Natural Bridge near Maquoketa.....	96
"	St. Donatus (Tete des Morts).....	96
Linn.....	Palisades, Cedar River.....	96
"	Palisades, Cedar River and Limestone Cliffs....	160
Louisa.....	Myerholz Lake.....	160
Lyon.....	Sioux Quartzite and Jasper Pool.....	128
Madison.....	Backbone Tunnel.....	96
"	Wooded scene at Devil's Backbone.....	192
Mahaska.....	The Bluffs on Des Moines River.....	64
Marion.....	Red Rock.....	192
"	Ruckman's Annual Soap Making.....	64
"	" Cabin, Exterior of.....	224
"	" Interior of.....	64
Mills.....	Waubonsie Trail Scene.....	64

County		Group after page
Monona.....	Loess Topography.....	224
"	Loess Bluffs from Wooded Side	224
Muscatine.....	Wild Cat Den, White Pines at.....	128
Osceola.....	Ocheyedan Mound.....	192
Palo Alto.....	Silver Lake, Dam and Outlet.....	224
Pottawattamie....	Loess Bluffs near Crescent.....	128
Van Buren.....	Farmington Park Lilies.....	160
"	" Keosauqua Park, Des Moines River.....	160
"	" " Scene in.....	128
Wapello.....	Monkey Mountain, Projecting Stone at.....	224
"	" " Wall of Rock near.....	128
Webster.....	Boneyard Hollow.....	192
Winneshiek.....	Ice Cave near Decorah.....	96
"	Grand View Upper Iowa River, Decorah.....	96

PLANTS

Anemonella	128
Beard Tongue.....	128
Botrydrium of the Woods.....	64
Canerlain Yew.....	192
Closed Gentian.....	160
Fringed Gentian.....	160
Isopyrum	160
Lady-slipper	96
Marginal Fern.....	224
Ninebark	160
Ostrich Fern.....	224
Pasque Flower.....	192
Prairie Clover.....	160
Purple Corn Flower.....	192
Reindeer Lichen.....	192
Shooting Star.....	224
Walking Leaf Fern.....	128
Wild Iowa Crab.....	128
Wild Plants, Group of.....	224
Wild Rice and Arrowhead.....	224

AMBASSADOR BRYCE ON CONSERVATION

Ambassador James Bryce, probably the most helpful critic of American institutions and affairs who has visited the United States said :

“The world seems likely to last a long, long time, and we ought to make provision for the future.

“The population of the world goes on constantly increasing and nowhere increasing so fast as in America. (North.)

“A taste for natural beauty is increasing, and as we hope, will go on increasing.

“The places of scenic beauty do not increase, but, on the contrary are in danger of being reduced in number and diminished in quantity, and the danger is always increasing with the accumulation of wealth, owing to the desire of private persons to appropriate these places. There is no better service we can render to the masses of the people than to set about and preserve for them wide spaces of fine scenery for their delight.

“From these propositions I draw the conclusion that it is necessary to save what we have got, and to extend the policy which you have wisely adopted, by acquiring and preserving still further areas for the perpetual enjoyment of the people.”—Annals of Iowa. Vol. XI. No. 2-3-p. 112.

IOWA STATE PARKS

Brief Description of Areas in Iowa Which Have Been Acquired or Are in Course of Acquisition for Public State Parks.

BONEYARD HOLLOW AND WOODMAN'S HOLLOW, WEBSTER COUNTY.

About ten miles southeast of Fort Dodge on the west bank of the Des Moines river; wild and beautiful scenery; rare plants and forestry; adapted to summer and winter sports; interesting historic associations and unusual pre-historic works and discoveries. Four hundred and fifty-seven acres purchased for thirty-eight thousand, five hundred dollars, toward which the local citizens paid ten thousand dollars in cash and provided, cost free to the state, two appropriate roadways.

THE DEVIL'S BACKBONE, DELAWARE COUNTY.

Twelve miles northwest of Manchester, four miles northeast from Lamont, four miles southeast of Strawberry Point; good roads. Purchased almost entirely from funds derived from half the hunting license proceeds, under Chapter 236, Acts of the Thirty-seventh General Assembly, therefore by the State Board of Conservation characterized as "The Gift of the Iowa Sportsmen to the People of the State." First public state park acquired; most wild and wonderful scenic area in interior Iowa; great bend of Maquoketa river; immense spring is a constant supply for fine trout brook; Maquoketa river to and including an ancient mill embraced; rare plants and forestry including best typical growth of native white pines; grotesque weathering of ancient limestone; unusual and rare glacial and erosive effects displayed; ideal camping place when facilities are provided. All lands purchased; total area, 1,400 acres.

NEAR FARMINGTON, VAN BUREN COUNTY.

One-half mile south of Farmington near Des Moines river, and state roads, unique geology; scenic gem; original timber undisturbed; natural lake and marsh of forty acres proposed to be improved so as to cover sixty acres; perfect for stocking with bullheads and other fish; rare field of lotus or chinquapin; throngs of the cardinal and other birds winter and summer; muskrat and other fur bearers numerous. One hundred acres purchased by local citizens for seventy-five hundred dollars and presented cost free to the state which has engaged to purchase two

additional acres, condemn or acquire roadways and improve the same and otherwise render the area enjoyable.

NEAR KEOSAUQUA, VAN BUREN COUNTY.

Extends from the town along the south bank of the Des Moines river at the toe of the horseshoe bend some two miles up stream, thence southward from the stream to include some 1,400 acres. Natural wild life sanctuary and set apart to the unmodified and undisturbed use of the natural species of wild animal and plant life; rough, wooded, brushy, the high hills affording rarest of vistas up, down and across stream and crowned with prehistoric mounds; the ruffed grouse observed in summer 1919, with quail most abundant; winter resort and summer breeding place of the cardinal; numerous dens of fox, skunk, mink, raccoon, opossum and groundhog; for a mile in all directions of the state lands, landowners voluntarily engage to assist the state in its protecting wild life, both on their lands and the lands of the state so that there shall be a protected undisturbed breeding place of approximately 5,000 acres; "Ely's Ford," a historic river crossing of pre-railroad days, famous then and ever since as a camping site for hunting, fishing, bathing and for winter sports. Acquired by purchase at an average of fifty dollars per acre to which local citizens contributed in cash something over seventy-six hundred dollars.

LEPLEY PARK, HARDIN COUNTY.

Three miles in a northerly direction from Union. Nine acres presented cost free to the people of Iowa by Mr. Irvin Lepley; the state to purchase some additional twenty acres. On the tract presented and that to be acquired are magnificent oak, elm, walnut, basswood and nearly every other native species of timber, wild flowers, woods, river, and important highways near make of this place an ideal gift to be dedicated to the perpetual use to which it has been devoted from the earliest civilized times, namely, the enjoyment of the great outdoors. The board feels that in withholding from mercenary disposition this area and its transfer to the state in the way and for the purposes stated, warrants the board in commending Mr. Lepley to the gratitude of the people of the state.

NEAR OAKLAND, POTTAWATTAMIE COUNTY.

The Oakland Chautauqua Association donates, cost free to the state of Iowa, its fifteen acres of ground of a high pecuniary value and still higher esthetic value as the first roadside park in Iowa, upon the condition that the state acquire a small additional area of ground completing and perfecting the foundation of an ideal roadside park. The additional ground being held at an exorbitant price, is yet to be condemned. The committee commends to citizens in other parts of Iowa the spirit of the Oakland Chautauqua Association as of the most practical, unselfish and farseeing character.

NEAR OAKLAND MILLS, HENRY COUNTY.

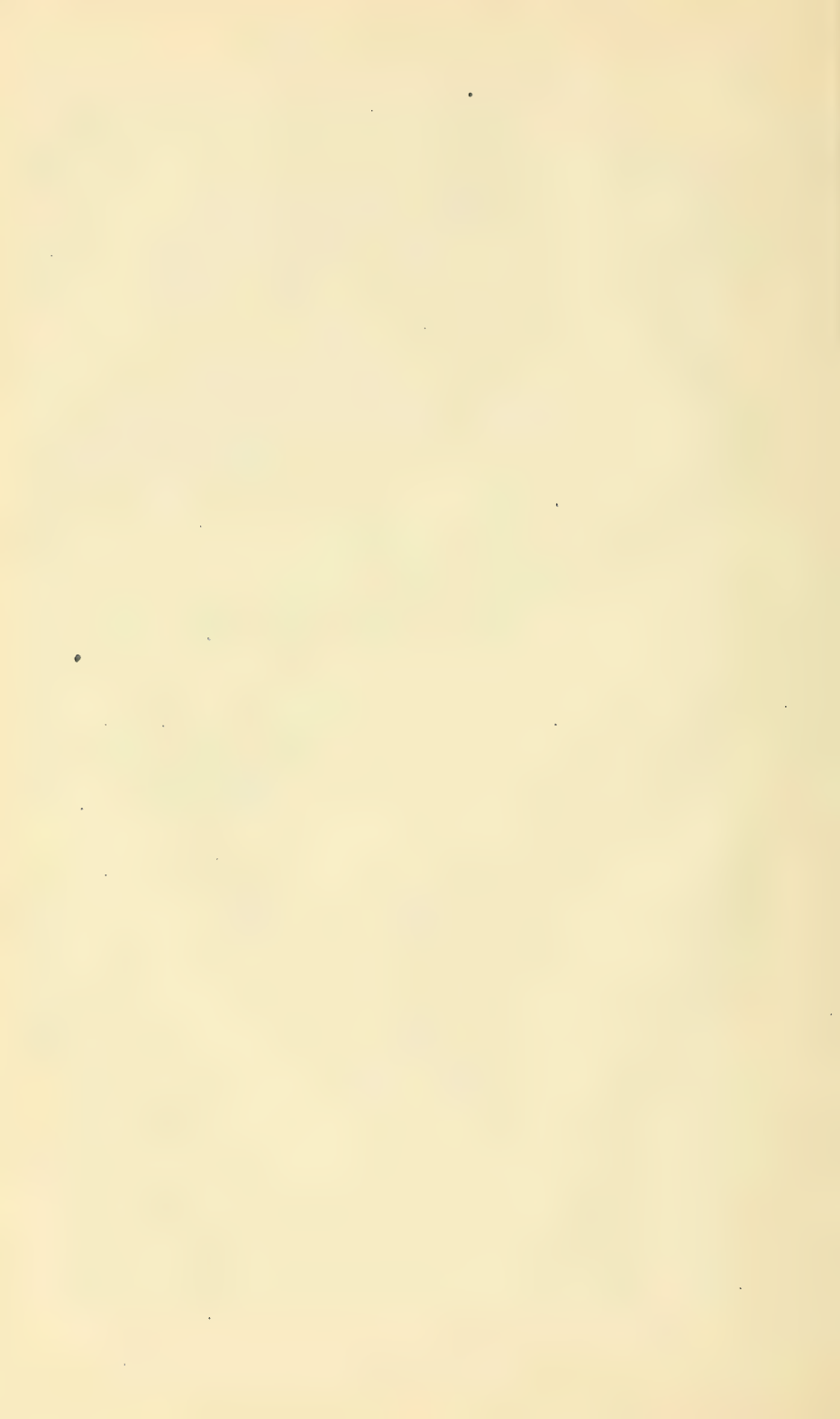
Four miles southwest of Mt. Pleasant on Skunk river, accessible from state roads, resorted to from remotest civilized and even during Indian times, for fishing and sugar making; rare plants and forestry; good boating and bathing; beautiful scenery; interesting history. acres in extent, a part of the ground and four thousand dollars donated, the state purchasing acres. Additional areas on margins of streams should be donated to the state, giving it complete, undisputed control.

ROOSEVELT PARK, FLOYD COUNTY.

Three miles in a northerly direction from Greene and four miles in a southeasterly direction from Marble Rock on the banks of the Shell Rock river. C. M. Mather donates cost free to the people of the state, some fifteen acres of ground together with an appropriate roadway thereto, providing the state acquire some additional ground, denominate this "Roosevelt Park," and furthermore, that in the use of this area certain rules differential to Sundays be established and enforced. A fine growth of woods and flowers; resort of every species of bird native and migratory in that region; picturesque bluffs and ravines; a dam in the river at Greene affords fine boating and fishing; for years much resorted to for fishing and to some extent for camping. The State Board of Conservation regards the donation of Mr. Mather as a distinctly public-spirited act and beneficial to the people of the state beyond present valuation. It individually and positively expressed to Mr. Mather, and here records that expression, that the reasonable rules recognizing and differentiating Sunday as the one day on which pastimes and performances of all sorts shall be in harmony with the mental attitude of devout people is a wholesome and welcome condition precedent to public acceptance of this gift.

WILD CAT DEN, MUSCATINE COUNTY.

Eight miles northeast of Muscatine near good roads. Misses Emma C. and Clara L. Brandt, nature loving sisters, present, cost free, sixty acres of the heart of one of the richest floral regions in the state. Picturesque in every way and the resort for years of classes in botany and forestry from the Chicago University and other institutions of learning; fishing, boating and bathing available especially if the area embrace one of the few remaining water power mills on the smaller stream. The state and local citizens engage to acquire the remainder of 300 acres along Pine creek to its confluence with the Mississippi river.



PROPOSED IOWA STATE PARKS

Areas in Iowa Suggested by Responsible Citizens as Suitable
For Public Park Purposes and So Regarded by the Board
of Conservation, From Which Selections Will Be
Made, Not Yet Acquired For the Want of Ap-
propriate Conditions Found or Created.

FIRST DISTRICT.

Des Moines Co., Starr's Cave—Cave and glen near Burlington.
Jefferson Co., Cedar Creek—Woods south of Fairfield.
Lee Co., Keokuk—Bluffs near Mississippi river.
Lee Co., Murray's Landing—Camp ground on Skunk river.
Louisa Co., Myerholz Lake—Near Wapello.
Louisa Co., Odessa Lake—East of Wapello.
Louisa Co., Toolsboro—Indian mounds, mouth Iowa river.

SECOND DISTRICT.

Jackson Co., Morehead Caves—Northwest of Maquoketa.
Jackson Co., Tete des Morts—Historic, picturesque, near Bellevue.
Muscatine Co., Chaney Lake—Near Bayfield and Cedar river.
Muscatine Co., Park Place Addition—Suburbs of Muscatine.

THIRD DISTRICT.

Black Hawk Co., Cedar Heights—Near Cedar Falls on Cedar river.
Black Hawk Co., Island—Above Cedar Falls.
Bremer Co., Shell Rock—Southwest of Waverly.
Bremer Co., Waverly Park—In suburbs of Waverly.
Dubuque Co., Catfish Creek—Two miles from Dubuque.
Dubuque Co., Durango Road—North of Dubuque.
Hardin Co., Alden, Iowa Falls—Along Iowa river.
Hardin Co., Steamboat Rock—Scenic, scientific, on Iowa river.
Wright Co., Cornelia Lake—Six miles northeast of Clarion.
Wright Co., Elm Lake—Six miles north of Clarion.
Wright Co., Twin Sisters' Lake—West of Belmond.
Wright Co., Wall Lake—Eleven miles southeast of Clarion.

FOURTH DISTRICT.

Allamakee Co., The Fish Farm—Indian mounds, near Lansing.
Allamakee Co., Waterville—Scenic and scientific.

Allamakee Co., Yellow River—Scenic and scientific.

Cerro Gordo Co., Clear Lake—Land bordering the lake.

Cerro Gordo Co., Hackberry Grove—Fossil beds, near Portland.

Chickasaw Co., Nashua Park—Near Nashua, woods.

Chickasaw Co., Nashua Lake—Near Nashua on Cedar river.

Clayton Co., Bixby Park—Wooded and scenic, southwest part of Clayton county.

Fayette Co., Arlington—Scenic, near Arlington.

Fayette Co., Dutton's Cave—Scenic, wooded, six miles from West Union.

Fayette Co., Falling Springs—Scenic, four miles northwest of West Union.

Fayette Co., Rocky Dell—Scenic, four miles northwest of West Union.

Floyd Co., Big Boulder—Biggest boulder in west, near Nashua.

Floyd Co., Charles City Park—Suburbs Charles City, Cedar river.

Howard Co., Lime Springs—Wooded, on Upper Iowa river.

Mitchell Co., Spring Park—Wooded, near Osage.

Winneshek Co., Blft. Balsam Grove—Rare woods, near Bluffton.

Winneshek Co., Ice Cave—Near Decorah, famous scenic, scientific.

Winneshek Co., Meader Farm—Woods near Hesper.

Worth Co., Silver Lake—Ten miles west of Northwood.

FIFTH DISTRICT.

Cedar Co., Cedar Valley—Eight miles southwest Tipton on Cedar river.

Cedar Co., Rochester—Seven miles south Tipton on Cedar river.

Jones Co., Monticello—Ten miles east Monticello, pictured rocks.

Jones Co., Oxford Junction—Picnic grounds on Wapsie river.

Linn Co., Palisades—On Cedar river, ten miles southeast Cedar Rapids.

Tama Co., Tama—Partly on Indian reservation near Tama.

SIXTH DISTRICT.

Mahaska Co., The Bluffs—Thirteen miles southwest Oskaloosa on Des Moines river.

Mahaska Co., Eveland Park—Wooded, southwest of Oskaloosa.

Wapello Co., Chilton Farm—Near Eddyville, Indian mounds.

Wapello Co., Eddyville—Woods near Eddyville.

Wapello Co., Eldon—Suburbs of Eldon along river.

Wapello Co., Monkey Mountain—Near Ottumwa, on Des Moines river, scenic, etc.

SEVENTH DISTRICT.

Dallas Co., Farlow Ford—On Coon river, north of Adel.

Dallas Co., Perry—Woods near Perry.

Dallas Co., Van Meter—One mile northeast of Van Meter, woods.

Madison Co., Devil's Backbone—Scenic, scientific, six miles southwest Winterset.

Marion Co., Red Rock—Historic, scientific, scenic, six miles northeast Knoxville.

Warren Co., Carlisle—On North river, near Carlisle, wooded.

Warren Co., Indianola—One mile west of Somerset, on Middle river.
 Warren Co., Middle River—Mouth Middle river, historic, wooded.

EIGHTH DISTRICT.

Lucas Co., Chariton—Five miles southeast Chariton on Chariton river.

NINTH DISTRICT.

Harrison Co., Missouri Valley—Woods, scientific, scenic.
 Harrison Co., Pisgah—Four miles west Pisgah, on Little Sioux river.
 Mills Co., Buckingham Lake—Southwest corner county.
 Pottawattamie Co., Council Bluffs—Northwest of city, bluffs and ravines.
 Pottawattamie Co., Manawa Lake—Near Council Bluffs.
 Shelby Co., Grove Township—Rare woods, northwest part of county.

TENTH DISTRICT.

Boone Co., Ledges—Scenic, scientific, on Des Moines river, south of Boone.
 Calhoun Co., Twin Lakes—Six miles north Rockwell City.
 Emmet Co., Estherville—Near town, fine woods, on Des Moines river.
 Emmet Co., High Lake—Three miles east Wallingford.
 Emmet Co., Iowa Lake—Northeast corner of county.
 Emmet Co., Swan Lake—Ten miles southeast Estherville, walnut grove.
 Emmet Co., Tuttle Lake—On north line of county.
 Hamilton Co., Little Wall Lake—Three miles south of Jewell.
 Hancock Co., Crystal Lake—In northeast part of county.
 Hancock Co., Eagle Lake—Timbered banks, four miles east of Britt.
 Hancock Co., Pilot Knob—Four miles southeast of Forest City, scenic.
 Hancock Co., Twin Lakes—In southern part of county.
 Palo Alto Co., Medium Lake—Suburbs of Emmetsburg.
 Pocahontas Co., Sunk Grove Lake—Four miles northwest of Fonda.
 Winnebago Co., Duck Lake—In northern part of county.
 Winnebago Co., Rice Lake—On eastern edge of county.

ELEVENTH DISTRICT.

Buena Vista Co., Pickerel Lake—In northeastern corner of county.
 Buena Vista Co., Storm Lake—Land on shore near town of Storm Lake.
 Cherokee Co., Cherokee—In northwestern suburbs of Cherokee.
 Cherokee Co., Pilot Rock—Four miles south Cherokee, large boulder.
 Clay Co., Peterson—Scenic, wooded, on Little Sioux river.
 Dickinson Co., Okoboji Lake—Adjacent shore.
 Dickinson Co., Spirit Lake—Adjacent shore.
 Lyon Co., Gitchie Manito—Scientific, granite, northwest corner of county.
 Monona Co., Blue Lake—Four miles west of Onawa.
 Osceola Co., Ocheyedon Mound—Near Ocheyedon.
 Plymouth Co., River Sioux Park—Near Westfield, on Big Sioux river.
 Sac Co., Lake View—Shore of Wall Lake.
 Woodbury Co., Stone Park—Suburbs of Sioux City.

SUPPLEMENTAL MEMORANDA.

Publication difficulties for which extraordinary conditions incident to the war are responsible, prevented the issuance of the first report of the Board of Conservation until so long a time after the materials were prepared, that it may now seem rather more historical than immediately practical in its character.

The time prior to August, 1919, was mainly used in the preliminary study and investigation necessary in the beginning of all departures in public affairs. The time after that date is therefore fuller of things accomplished. It is of these things begun or done the commission feels something should be said at least in brief, pending the more elaborate publication of matter relating thereto that may be further and indefinitely delayed on account of conditions incident to the war, and the foregoing brief summary has been prepared to meet this need.

There are a number of areas not falling into the two classes here set forth, such as Fort Atkinson, a purely historical area; proposed McGregor National Park of too great an extent for a state project, and certain lake bed areas too expensive for acquisition from present funds.

All these areas and others of like character are in contemplation by the board for acquisition through special appropriations or co-operation with other persons or the general government.

DEDICATION OF PARK AREAS.

The Board of Conservation contemplates a series of programs dedicating the areas that have been or may be acquired, the coming summer. Addresses of eminent men in and out of Iowa at the respective areas may be expected to compose the complete account of historic, scientific, scenic and recreational interests they respectively possess as public state parks. There will be revealed the detailed account of the amount of lands received and monies paid to individuals, the amount of lands donated and all conditions going therewith and the amounts of money donated by local persons and organizations toward assisting the state in acquiring the lands. The series of dedications may be expected to produce and make generally known the rule and practice for the use of the areas. They will lay down the state policy for the further acquisition and administration of public state parks.

The Board of Conservation has been constantly surprised and inspired by the apparent universal and helpful interest of the substantial citizens of each community in which it has made effort to carry forward the policy of establishing public state parks. Names of these men and women are in our files and will remain forever in our archives to their credit. They are omitted here merely on considerations of economy of time and money.

EDGAR R. HARLAN, Secretary.

Des Moines, Iowa, April 1, 1920.

IOWA PARKS

Introduction

In its seventy years existence as a State, Iowa has swept from a scattered settlement to a thickly populated farm-land, dotted with towns and cities. It received from the United States Government certain of the lands as a gratuity and the rest of the lands have been received by the individual citizens, at a cost of a dollar and a quarter per acre. The Indians had parted with them at a return to themselves of about ten cents per acre.

The state was settled up, its roads laid out, its cities planned upon ox-cart conveniences and policies. The roads, therefore, were treated as subordinate to the claims and farms, and were only left where they were received from the Indian upon the natural ground-levels, until settlement reached them from the eastward, then they were torn from their ancient courses and bent around the corners of "forties" and "quarters," regardless of hills that would never grow less and water-ways that would never be filled and grades that would never be fixed. The celerity of passage was subordinated to that of production.

At such a time the reasonable day's journey for a man in a conveyance of any sort was twenty miles. His journeyings were limited to necessity and to business. Iowa territory in 1840 embraced our present state and most of Minnesota and North and South Dakota, and contained 24,355 men, and 18,757 women.

In 1915, the numbers had increased to 1,212,932 men and 1,145,134 women. Roads and vehicles now easily admit of journeying a hundred miles a day. Culture and habit as well as business and health urge the individual frequently to leave off routine and engage in pastime and out-door games. The impulse to respond increases and will probably continue increasing so long as men shall work and play.

But in 1919 there were not ten acres of public woods, water-landings or open prairies, in the state, unless in cities. Not a game could be played, a shot fired, a race run, a fly cast or a lunch spread, unless in cities or on dusty highways unless the enjoyment was a trespass or was through the consent of private owners. In 1919 the acre which the Indian sold for ten cents and a pioneer bought for \$1.25, and the tax-sale purchaser secured for delinquent taxes has

become the \$300.00 range of registered cattle, sheep or hogs and in turn the field of wheat, oats, corn or hay of such value that the ancient paths of men now cost money. In their righteous ire farmers have destroyed groves of hickory, sold their walnut trees and cleared plum thickets to rid themselves of trespassers. Road sides, waterways, fields, and groves today bear literally thousands of "No Trespassing" signs, and still the principle born in men and women to run and leap in youth, to stroll and race in full growth and to hunt and fish as life is passing, has never changed. In their refinements, these tendencies become the spur to every soul who

"Finds tongues in the trees,
Books in the running brooks,
Sermons in stones
And good in everything.
I would not change it."

And so the lands that now possess agricultural value mingled with historical, scientific, scenic or recreational character are under consideration for re-acquisition by the state, and return, where possible, to their pristine condition and public use. The Creator foresaw and provided that the lands suited to agricultural and industrial purposes were generally of the highest pecuniary value and that those for use by the scholar, artist, hunter and fisherman are as nearly worthless as He could allot to Iowa. So the Commission, in harmony with what it feels is an almost divine opportunity and with what it knows to be the certain and reasonable conflict of natural human interests in the uses of lands, has entered upon the effort without interference with production of Iowa lands, to increase their scope and restore their uses for science, art and recreation.

Results so far attained are to be found in the minutes, papers and documents published herewith as the First Report of the Iowa Board of Conservation.

EDGAR R. HARLAN,
Secretary.

REPORT OF THE CONSERVATION COMMISSION

Hon. W. L. Harding, Governor, and Members of the Executive Council:

Gentlemen:—In compliance with your request for a report of the investigation and researches of the Board of Conservation of the State of Iowa, we have the honor to submit the following report of our findings for your consideration.

The Board met pursuant to your notice and call, at Des Moines, Iowa, on December 27, 1918. The organization was perfected by electing Dr. L. H. Pammel, of the Iowa State College of Agriculture and Mechanic Arts, President, and Edgar R. Harlan, Curator of the Historical Department of Iowa, Secretary. The Board immediately proceeded to make the investigation contemplated in Section 9, Chapter 236, Laws of the Thirty-seventh General Assembly. It would seem impossible that an investigation within the time intervening between December 27, 1918, and the present date, would be extensive or comprehensive enough to be of any great value to the executive council. We, therefore, do not wish to convey the impression that the report which is submitted by the board covers only the information secured from the personal visits and researches made during that period. On the contrary, it represents the compilation of all the information which the board was able to secure from a diligent search and study of the many papers and reports previously made by students of natural history, archaeology, geology and forest reserves, as well as the information obtained in a few of the many places of scenic, historical, scientific and recreational interest in which our state abounds.

We have had access to the reports of such students of conservation and natural history as Dr. T. H. Macbride and the hosts he has inspired, as well as contributions from many other good people of our state, who have rendered us valuable assistance in our work, to all of whom we have given credit for their efforts in making our report as complete as possible in the limited space of time elapsed since the organization of the board.

Our examination of the many proposed park sites and reserves has impressed us with the belief that the time has arrived for the great State of Iowa to take a decisive stand to protect and conserve for future generations some of the many beauty spots

of the state, as well as preserve in its original form a portion, at least, of what is left that indicates the original natural condition of our prairies, forests and waters with their wealth of varied plant life as well as wild animal and bird life native to them, before our sometimes over-selfish civilization exterminates and drives them from their homes.

There are many reasons why no further delay should be made in securing a number of the many desirable sites for state memorial parks. Each day, the hand of so-called civilization is making further inroads into our remaining forests. The beauty of our glens and caves is being destroyed by cutting away the shade trees, diverting the streams from our springs, in fact, commercial vandalism and private ownership are making an indelible mark on many of the beauty spots which should be sacred to the lover of nature, to our children and future generations that they may see a little of Iowa, at least, in its primitive state.

We say primitive state because we believe that if some proposed sites are acquired, and control of them assumed by the State, that nature will reassert herself and recreate or reproduce some of the stately forests that formerly fringed our river banks and lake shores and dotted over our hills. Twenty-five years' growth added to the present growth of the certain remaining forests of Iowa, with the watchful care of the State, will reforest such tracts as are selected into practically the same condition that existed fifty years ago. With return of the forests and their conversion into, and dedication as, sanctuaries for bird, animal and plant life there will return much of the early wild life that has gradually disappeared from the wooded hills and vales of Iowa.

Another particular reason why we believe that immediate action should be taken is the ever-increasing value of lands in Iowa. Each year's delay will make the acquisition more expensive to the State. It has been suggested that we secure, at this time, as memorial parks for the State of Iowa, some of those beauty spots, and dedicate them to the memory of our boys who have fallen in France and in the other fields, in defense of Democracy and Right. Some suggest that other areas should be dedicated to the leaders and heroes of high standards in Iowa attainment in the arts, sciences and sportsmanship. Our allies in France have already dedicated to the memory of the American Marines, a part of the battle field of Belleu Wood as a mark of their love

and as a tribute to the bravery of the Marines. The general government has named certain areas and objects for great characters of national and international renown. Why should we hesitate to assign to our own a fitting memorial?

Let us call attention also to the recreational value of such parks as well as the value to the student and scientist. What would be more commendable than to have located in different parts of the State recreational parks so distributed that practically all sections of the State could be served without traveling to exceed fifty miles except in extreme cases where the enthusiast requires some special type of natural object or advantage? Our wooded river banks and lake shores are ideal for recreational parks as well as valuable for study of natural history, forest reserve, geology and propagation of wild life, and furnishing splendid fields for the students of plant life also. Indeed they are now, although owned, fenced, taxed and properly used for grazing and agricultural purposes. Why should a farmer be forever obliged to follow the trespassing stranger every few days to repair fences, close gates and suffer damage, often innocently done, but still committed? Why not acquire and pay for his lands, open them to the full use of the public forever and do justice to all concerned?

Summing up our report, we do not hesitate to say that Iowa has within its borders many of the rarest places of historical and scientific interest that might be conserved to the general good of its people, that the opportunity of combining comfort and recreation, with the knowledge to be obtained from a study of plant life, natural beauty and resources still exists and that we should avail ourselves of the opportunity of acquiring them for all of the people of our state for all time.

It apparently was the intention of the Legislators of Iowa to have this park development financed by using funds collected in the Fish and Game Department. No doubt, a great deal can be accomplished by this plan. Nevertheless, it is bound to be a very slow process if the development is left to that fund alone. There is danger that the drawing of any amount from that source will curtail improvements that should be made on the banks or shores of our rivers and lakes and prevent the sufficient stocking of the waters of the State with fish.

We, therefore, do recommend that an annual levy of two-tenths of a mill be made upon all the property of the State for the pur-

pose of acquiring, improving and maintaining Memorial State Parks in the State of Iowa, and that legislation be enacted providing ways and means for the improvement, regulation, control, and proper policing of such parks under the jurisdiction of a State Board of Conservation and that this be done forthwith.

We would also suggest that the report submitted herewith be published in book form with suitable illustrations, that a sufficient number of copies be printed to furnish one copy at least to each Public and School Library in the State of Iowa for reference and educational purposes, that a guide or directory be made up therefrom with such maps, plats, illustrations and road direction as would be suited to the use of the public in finding and visiting all areas and thereby easily and accurately become informed upon every essential of the value, area, extent, cost, interest for beauty, history, science and recreation.

We are prompted to make this suggestion from the fact that the report contains data of unusual interest bearing upon the early history of Iowa, dating from the period when this territory was looked upon more as a trappers' field than a great industrial and agricultural state; a very complete summary as well as chronological history of the early development of this territory and state, pointing out to youth and recent comers the many history making epochs, localities and sites whereupon vital questions were decided that bore upon the early occupation and development of this region. The historical nature of this report will be found equal to and perhaps excelled by its interest upon the subjects of plant life, forestry, archaeology, geology, physiography and allied subjects.

Respectfully submitted for your consideration,

L. H. PAMMEL, Chairman.

JOSEPH KELSO, JR.,

JOHN F. FORD,

EDGAR R. HARLAN, Secretary.

Board of Conservation.

PUBLIC PARKS OF IOWA

ESTABLISHMENT OF IOWA PARKS

The law Providing for the same and Proceedings of the Board of Conservation.

Chapter 236, Acts of the Thirty-seventh General Assembly and Amendments thereto.

An Act to authorize the establishment of public parks by the State Fish and Game Warden (the Thirty-eighth General Assembly amended this Act by substituting for "the State Fish and Game Warden," "the State Board of Conservation"), by and with the consent of the State Executive Council, and to provide for the improvement of the same, and to create a board of conservation for the preservation of places of historic, natural or recreational interest authorizing donations in aid of such purposes and to make an appropriation therefor, providing for aid by municipal corporations and authorizing boards of supervisors to extend county road systems in furtherance of the provisions of this act.

Be It Enacted by the General Assembly of the State of Iowa:

Section 1. The State Board of Conservation by and with the written consent of the Executive Council, is hereby authorized to establish public parks in any county of the State, upon the shores of lakes, streams, or other waters of the State, or at any other places which have by reason of their location become historic or which are of scientific interest, or by reason of their natural scenic beauty or location become adapted therefor, and said Board of Conservation, under the supervision of said Executive Council, is hereby authorized to improve and beautify such parks. When so established they shall be made accessible from the public highways, and in order to establish such parks said Executive Council shall have the power to purchase or condemn lands for said purposes and to purchase and condemn lands for said highway purpose.

Sec. 2. The State Board of Conservation shall, under the direction of the Executive Council, have the power to erect dams across streams and across outlets of lakes for the purpose of raising the water level therein, and any damages occasioned to riparian owners by reason of the raising of such water level shall be paid for out of the fund hereinafter provided for.

Sec. 3. The title to all lands purchased or donated for park or highway purposes under the provisions of this Act shall be taken in the name of the State, and if thereafter it shall be deemed advisable to sell any portion of the land so purchased, the proceeds of such sale shall be placed to the credit of the said Fish and Game Protection Fund (the Thirty-eighth General Assembly amended this act by substituting for the "Fish and Game Protection Fund," "Public State Parks Fund,") to be used for such park purposes, except that on the request of any of the donors of the fund with which such land was purchased, the amount contributed by the donor making such request shall be refunded to such donor, without interest, provided that application for such refund must be made within six months from the date of the sale of such lands, and provided also, that no such lands shall be sold except in compliance with legislative enactment designating specifically the lands to be sold.

Sec. 4. The Executive Council is empowered and authorized on behalf of the State to receive donations of land for either park or highway purposes in conformity with the provisions of this Act, and lands so donated shall not be sold, and if abandoned by legislative enactment, shall revert to the original owner.

Sec. 5. The State Treasurer shall have authority to receive and accept, on behalf of the State, donations for the purpose of aiding in the carrying out of the provisions of this Act, and the donor may specify the place where and the purpose or purposes for which said donation is to be used or expended, and when such specification is made to the Executive Council by the donor the donated funds shall be expended for no other purpose.

Sec. 6. The State Board of Conservation shall permit the improvement of such parks, when established, or the improvement of bodies of water, upon the border of which such parks may be established, by the expenditure of private or other funds, such improvement to be done, however, under the direction of the State Board of Conservation, by and with the consent of the Executive Council. The Executive Council may call upon any agencies of the state for assistance and information. When such state agencies' traveling expenses are not otherwise provided for, they shall be paid from the Public State Parks fund, as other traveling expenses are paid.

Sec. 7. Municipalities, or individuals, or corporations organized for that purpose only, acting separately or in conjunc-

tion with each other, may establish like parks outside the limits of cities or towns, and when established without the support of the Public State Parks fund, the municipalities, corporations or persons establishing the same, as the case may be, shall have control thereof independently of the Executive Council. Provided, however, that none of the said municipalities, individuals or corporations, acting under the provisions of this section shall establish, maintain or operate any such parks as herein contemplated for pecuniary profit.

Sec. 8. The board of supervisors of any county in which there is a body of water which may be improved under the provisions of this Act is hereby authorized, at their discretion, to add to the county road system from the township roads, such roads as will make said body of water more accessible, or unite existing county roads to make a county road around a meandered lake.

Sec. 9. The said Executive Council shall designate three persons, who, with the Curator of the Historical Department, shall constitute a Board of Conservation, who shall serve without pay. Such Board of Conservation shall investigate places in Iowa, valuable as objects of natural history, forest reserves, as archaeology and geology, and investigate the means of promoting forestry and maintaining and preserving animal and bird life in this State and furnish such information to the Executive Council for the conservation of the natural resources of the State, from time to time, and said recommendations shall be printed in such numbers as the Council shall authorize, and shall be furnished each member of the succeeding General Assembly.

Sec. 10. The Board of Conservation and the Executive Council, acting jointly, shall from time to time make such regulations as they deem necessary or advisable for the management, control or policing of said lands, and shall cause said regulations to be printed on card-board, wood or metal signs and posted in said parks. The destruction or mutilation of said signs bearing said regulations shall be deemed a misdemeanor. Said regulation, however, shall in no wise interfere with the local police powers.

Sec. 11. (The Thirty-eighth General Assembly amended this section by substituting the following:) For the purpose of carrying into effect the provisions of this Act, there shall be appropriated out of the Fish and Game Protection fund any portion thereof which is in the judgment of the Executive Council unnecessary

for the support and maintenance of the Fish and Game Department and in addition thereto there shall be appropriated out of any moneys in the State Treasury not otherwise appropriated, the sum of \$100,000.00.

PROCEEDINGS OF THE BOARD.

Des Moines, Iowa, December 27, 1918.

The Executive Council met in special session for the purpose of conferring with the Board of Conservation with reference to the future development and conservation of the natural resources of the state and the adoption of a general policy with reference to the purchase and improvement of park sites and natural beauty spots as well as the preservation of points of geological and archaeological interest as contemplated by Chapter 236, Acts of the Thirty-seventh General Assembly. The entire membership of the Board of Conservation was present, including E. R. Harlan, Curator of the Historical Department, Professor L. H. Pammel, of Ames, Hon. John F. Ford, of Fort Dodge, and the Hon. Joseph Kelso, of Bellevue. There was also present at the conference, Thomas MacDonald, Chief Highway Engineer, L. E. Foglesong, Associate Landscape Architect of the Capitol Grounds Extension, and O. W. Crowley, Capitol Grounds Extension Engineer, and Senator B. W. Newberry, of Strawberry Point.

The matter of a general policy for the state to pursue in the preservation of park sites and points of natural beauty within the state was discussed at some length. L. H. Pammel and E. R. Harlan addressed the conference upon the subject with an outline of plans which should be pursued in such work.

The matter of purchase of the "Devil's Back Bone" property in Delaware County as an initial step in the direction of state ownership of parks was taken up for consideration. L. H. Pammel, E. R. Harlan, L. E. Foglesong, Senator Newberry and Treasurer E. H. Hoyt discussed the various angles of the desirability of this property for preservation as a state park, recommending that it be purchased. At noon the conference adjourned for the purpose of permitting the Board of Conservation to meet as a Board and organize and adopt resolutions for submission to the Council.

Des Moines, Iowa, December 27, 1918.

The Board of Conservation assembled, in the office of the Treasurer of State all the members, Dr. L. H. Pammel, Curator E. R. Harlan, Hon. Joseph Kelso, Jr., and Hon. John F. Ford being present.

The meeting was called to order by Curator Harlan. By motion Dr. Pammel was elected chairman of the Board. By motion Curator Harlan was elected secretary.

The following resolution, presented by E. R. Harlan, was adopted unanimously and ordered presented to the State Executive Council, representing the sentiment of the Board of Conservation as to the general policy which that body regarded as essential for the proper development of the state's resources and particularly with reference to the purchase of the "Devil's Back Bone" property in Delaware county.

Whereas, the matter of the report of the State Game Warden, E. C. Hinshaw, recommending for acquisition by the State of Iowa the area in Delaware county, generally known as the "Devil's Back Bone," being before the Board of Conservation and being made a part of the minutes of this meeting, and:

Whereas, the area having been thoroughly examined by members of the Board, together with other persons authorized and directed by the Executive Council so to do, it is

Resolved that the Board of Conservation recommend to the Executive Council, in compliance with the report and the recommendation of the Game Warden, the purchase of not less than twelve hundred (1,200) acres, or as much more as may to the Council seem advisable to acquire, for a state park, in the region of what is known as the "Devil's Back Bone," Delaware county, Iowa, the same to embrace both banks of the Maquoketa river at Forest Mills and up stream to what is known as Trout Brook and both banks of the latter stream up to and including Richmond Spring, together with such additional grounds as may to the Executive Council seem adequate to the purpose of the statute.

A more detailed and specific report of the scientific, scenic and historic qualities of said area is to be filed later and made a part of this report.

Resolved that in consideration of the service and sacrifice by men and women of this state to the purpose and achievement of our common country in the World War, and of Iowa valor in the Civil War and other wars, that the policy hereby initiated in the public affairs of Iowa shall be the mark of our obligation and is the solemn tribute of this day and hour; therefore, we recommend that all areas in pursuance of Chapter 236, Acts of the Thirty-seventh General Assembly, should be known and denominated as Iowa Memorial Parks.

The Executive Council convened at 2:00 p. m. with all members present.

The report of the Board of Conservation as to officers elected and the adoption of the foregoing resolution was presented to the Council by E. R. Harlan, Secretary of the Board of Conservation. After some discussion, the following resolution was offered by Governor Harding:

Whereas, the State Game Warden, E. C. Hinshaw, has recommended the purchase by the State Executive Council of Iowa of an area in Delaware county known as the "Devil's Back Bone," and adjacent property necessary for encompassing the natural boundary lines of said "Devil's Back Bone" and sufficient for the establishment of a recreation spot—said area to include not less than twelve hundred (1,200) acres of ground subject to the judgment of the Executive Council, and

Whereas, the State Board of Conservation has adopted a resolution as set out in the foregoing record recommending such purchase and the establishment of a general policy by the state for purchasing and acquiring areas and tracts of lands suitable for park purposes as provided under Chapter 236, Acts of the Thirty-seventh General Assembly, to be known as Iowa Memorial Parks, therefore,

Be it resolved, by the Executive Council of the state of Iowa that the sum of sixty thousand (\$60,000.00) dollars in the state treasury, provided for and set aside for the purchase of parks under Chapter 236, Acts of the Thirty-seventh General Assembly, being appropriated for the purchase of the property known as the "Devil's Back Bone" in Delaware county, of not less than twelve hundred (1,200) acres and that said sum be set aside in a separate fund to be drawn against for the purchase of such property.

Be it further resolved that the Council concur in the recommendations of the State Board of Conservation for the definite state policy for the establishment of a series of parks to be known as the Iowa Memorial Parks in consideration of and in commemoration of the service and sacrifice by men and women of the state to the purpose and achievement of our common country in the World War, and of Iowa valor in the Civil and other wars.

Be it further resolved that Auditor Shaw and Treasurer Hoyt be appointed by the State Executive Council as representatives of the Council and delegated with authority to act in the purchase of the property known as the "Devil's Back Bone" in Delaware county for State Park purposes as recommended by E. C. Hinshaw, State Fish and Game Warden and the State Board of Conservation, and,

Be it further resolved that the said State Auditor, F. S. Shaw, and State Treasurer, E. H. Hoyt, have set apart for the purpose of making the purchase contemplated under this resolution as delegates of the Executive Council for binding said contracts as fast as entered into the sum of five thousand (\$5,000.00) dollars from the funds available for said purpose as provided under Chapter 236, Acts of the Thirty-seventh General Assembly, and

Be it further resolved that the said Auditor Shaw and Treasurer Hoyt be authorized to enter into contracts with the owners of said land and make a small payment of not to exceed two (\$2.00) dollars per acre to bind the contract and that they be authorized to sign contract for and on behalf of the Executive Council for the State of Iowa in said matter—the title to said land to be taken in the name of the State of Iowa, and,

Be it further resolved that no part of such land shall be contracted for by the said Auditor Shaw and Treasurer Hoyt for which the agreed

price is to exceed sixty (\$60.00) dollars per acre, except that when the said Auditor Shaw and Treasurer Hoyt are unable to agree upon a price within the amount fixed as a maximum price, the Governor is authorized to appoint a committee of three members, one of whom shall reside in Manchester, one in Strawberry Point, and one in Lamont, and it shall be the duty of the purchasing committee to get the approval in writing of all members of the Valuation Committee in every purchase of real estate in excess of said fixed maximum. All members of the Council voted aye, and the resolution was declared adopted.

Governor Harding announced the following standing committee, as a valuation Committee, in pursuance of the foregoing resolution: Hon. George W. Dunham, Manchester; Hon. B. W. Newberry, Strawberry Point; W. A. Abbott, of Lamont.

Council Bluffs, Iowa, January 1, 1919.

The Board of Conservation convened at the Grand hotel. Those present, Messrs. Pammel, Ford, Kelso and Harlan.

The matter of the inspection of the Lower Des Moines area being before the Board, the separate reports of Dr. Pammel and Mr. Harlan were read and that of Mr. Kelso orally made, all were taken under consideration.

It was moved by Mr. Ford that the area designated as The Lower Des Moines area, namely from Belfast to Eldon, be recommended for acquisition, the recommendation to be accompanied with maps and descriptive details showing accurately the essentials necessary, for the Executive Council to have before it in order to exactly describe the lands proposed to be acquired and that the character of the same for historic, scenic and scientific value to the present and future public. Motion carried.

Mr. Harlan submitted the following resolutions:

Whereas, this Board seeks the ends aimed at by the Fish and Game Department, by the Executive Council, and all concerned in the execution of Chapter 236, Acts of the Thirty-seventh General Assembly, and

Whereas, The authority and responsibility of the Board remains somewhat vague with respect to the best ways and means for assisting in the execution of said statute, and

Whereas, by statute it is within the power of the state to arrive at the fair and accurate values of all lands it acquires for public purposes through condemnation proceedings, wherein a jury of appraisement shall be constituted so that no more than one member shall hail from a county wherein lands to be condemned shall be situated,

Resolved, that it is the sense of this Board that in the matter of prices to be agreed to for lands to be acquired, the Executive Council

arrive at the same through the convocation of a board in every instance, the members of said board to have that ability, integrity and place of residence fitting for service upon a condemnation jury, and

Resolved, that wherever owners and state do not agree upon the same or a less consideration fixed by said Board, the state shall proceed as a matter of course to the acquisition by condemnation.

Resolved, that recommendation to the Executive Council be formulated by members Ford and Kelso, of such character as shall, when made public, make clear to all concerned both that this Board has nothing to do with negotiations for acquiring and the persons and conditions governing acquisition.

The resolutions were adopted.

Mr. Harlan moved that a circular letter be prepared suitable to publish and to mail, setting out in brief the objects, the terms and the considerations for the acquiring of lands under this act, said circular to contain, among other things, the following:

"It is respectfully suggested that the state of Iowa wishes to acquire such lands as can be acquired by gift or from proceeds available from the hunting license fees, paid in, where said lands would be suited to be held by the state for public gathering places such as reunions, celebrations and picnics or to commemorate any worthy person or historic event; or to afford assistance in the study in the field and from natural phenomena to students of the natural history of our state; or for camping, hunting, fishing, bathing and other recreational pastimes; or for the purpose of the preservation or propagation of species of wild, native animals and plants otherwise rare or in danger of extermination.

"It is the province of this Board to accept suggestions of such areas and to search for and report the same for acquisition by the Executive Council, on behalf of the state, but the Board, having no power to contract, is not interested in securing options or other tentative or final money terms. This is wholly in the hands of the Executive Council, who will make all negotiations.

"This Board reports as to why an area ought to be acquired and you can therefore greatly aid by furnishing responses to the following inquiries:

"What are the historical facts connected with the area? Where have the facts been published?

"What are the scientific facts connected with the area? Who has written of these and where were his ideas published?

"What are the interesting points for sightseeing and what things are to be seen?

"Mention waters, trees, rocks, mounds, houses and everything you consider interesting."

The motion, being put, it was unanimously carried.

Dr. Pammel moved that a list of places now thought suitable to be reported to the Executive Council for reservation be prepared, based upon the list of Dr. Shimek, but elaborated as to the places cited and augmented by information possessed at present or that may be accumulated by the membership by our next meeting.

Mr. Kelso seconded the motion, with the proviso, that such list be prepared by Messrs. Pammel and Harlan.

As amended the motion was put and carried unanimously.

By Harlan: I wish to submit, with the view of asking the approval of the Executive Council, an outline of the scope it appears to me we are expected to take. This is marked "C" and attached to these minutes entitled "Scheme for Investigation and Report."

By Ford: I think the scheme ought to be considered by this Board as outlining its field, and be submitted to the Executive Council for its consideration. If by the Council approved, then the Secretary should be directed to prepare in a form for publication, such matter as fairly falls within the scope of the scheme.

By Mr. Kelso: I move that it is the sense of the Board that Messrs. Harlan and Pammel prepare such matter as is of probable interest and value, as suggested by Mr. Ford.

By Ford: I second the motion.

The motion, being put, was unanimously carried.

By Mr. Harlan: There are a great number of citizens who own desirable park sites, yet who have no descendants. I believe there are those who would willingly bequeath to Iowa certain lands or other valuable property if it were administered and made a credit memorially to the object chosen by the donor. Therefore,

I move that the Executive Council be requested to pledge the state to accept and to carry out any testimonial arrangement that will both benefit the public and be a credit to the donor, provided the state shall not be obligated to pay out money, except such as is in the bequest, and provided the state shall reserve the absolute authority to design every structural object and approve every inscriptive text proposed to be used in carrying out the bequest and provided, further, that such bequest shall be always, in records and maps issued by the state relating to this subject, there

shall be a suitable and sufficient designation of the area or object bequeathed, so that the fact of the bequest shall never become lost or confused in the records and in the intelligent interest of the public. .

Motion was adopted.

Des Moines, Iowa, February 12, 1919.

The State Board of Conservation met at the office of the Curator of the State Historical Department, members present, Messrs. Kelso, Ford and Pammel.

Motion passed accepting the Ford report.

Motion passed accepting the letter of transmittal by Mr. Ford.

Motion passed that the board recommend the conservation of areas in Southeastern Iowa and that the immediate conservation of areas in Southwestern Iowa follow:

The following resolutions were adopted:

Resolved that the Board of Conservation express their appreciation of the courtesy and assistance rendered to them by the staff of the Historical Department, two members of the staff of the State Agricultural College and to Dr. Lees, State Geologist, and

Resolved that the same be made a part of the minutes of this meeting and that a letter to the Executive Council be written to contain the same and also to voice the findings of the Board regarding the favorable opinions expressed by the general public.

Adjourned.

Des Moines, Iowa, Feb. 22, 1919.

A meeting of the Conservation Board and the Fish and Game Warden with the Executive Council was held in the office of Treasurer of State.

The meeting was called to order by Treasurer E. H. Hoyt; present of the Executive Council, E. H. Hoyt and F. S. Shaw; Fish and Game Warden, Hinshaw; of the Conservation Board, J. F. Ford, Joseph Kelso Jr. and L. H. Pammel, Mr. Harlan being absent. State Treasurer Hoyt invited W. C. Ratcliff and W. H. Walrath, respectively of the House and Senate Committees on Conservation, to meet with the Conservation Board and the Executive Council.

The committee went over the doubtful clauses in the proposed bill, and the doubtful passages were whipped into shape. It was

then left to Mr. Hoyt to get the bill in shape. Mr. Hoyt introduced Mr. Ratcliff and Mr. Walrath. Mr. Hoyt then went over the present law and told of the appointment of the Conservation Board, after which L. H. Pammel told of the work of Messrs. Harlan, Kelso and Ford in getting up the report. The discussion was participated in by Messrs. Ford, Kelso, Hinshaw, Hoyt and Shaw. The president then read the title of the bill and the head lines and portions pertaining to Memorial State Parks, Highway Parks and Lake Parks. It was the consensus of opinion acting on the suggestion of Mr. Hoyt, that we meet with the Conservation Committee of the Senate and House at a dinner in the Grant Club rooms.

It was also unanimously agreed that the bill be introduced as a committee bill in the House and Senate. Adjourned.

Cedar Rapids, Iowa, April 26, 1919.

A meeting of the Conservation Board was called in Cedar Rapids on April 26, 1919, for the purpose of inspecting the area known as Palisades in Linn County, an urgent invitation having been extended by Mr. Fred Lazell, of Cedar Rapids, the Commercial Clubs of both Cedar Rapids and Mt. Vernon, the Conservation Circles of Iowa City and Cedar Rapids and some members of the faculty of the State University and Cornell College.

The Board met at 8:15 p. m. in the parlors of the Montrose Hotel. There were present Joseph Kelso, Jr., J. F. Ford, Dr. L. H. Pammel, Mr. Harlan being absent.

In the afternoon an inspection was made of West Palisade, some eighteen miles from Cedar Rapids. The Board was taken to this region by Fred Lazell, Attorneys Wick and Bolton of Cedar Rapids and Professors Kelley and Keyes of Mt. Vernon. There were also present the executive board of Iowa Conservation Association consisting of G. B. McDonald, Euclid Saunders, Mr. Bennett, Dr. Kay, Mrs. C. H. McNider and Mrs. Fred Lazell.

At the meeting on the evening of April 26th the following action was taken:

It was decided that we take no action concerning the Palisades at this time, though we think it a very desirable park site and think it should be acquired by the State.

That Mr. Harlan, Secretary of the Board, be asked to draft rules, giving methods of procedure to acquire park sites, that

this be prepared and presented to the Executive Council at an early date. That we have a joint meeting with the Executive Council and go over the matter of acquiring State Parks under the amended law.

A communication from Mrs. Kappel, of Nashua, in regard to a state park site was placed on file.

Communications from Senator Holdoegel in regard to Twin Lakes and Bone Yard Hollow in Webster County and petitions from citizens of Waukon and Postville in regard to state park sites near Waterville and the Yellow River region were placed on file for consideration at an early date.

A request was received from Mrs. C. H. McNider, of Mason City, asking that we take up as soon as possible the matter of Pike's Peak area and the offer from Mrs. Munn to the United States government. Mrs. McNider asked the State Conservation Board to try to secure this gift for the state so that the area might be secured immediately for state park purposes.

With reference to the natural bridge in Jackson County, Joseph Kelso stated that the citizens of Jackson County would materially assist in securing this area.

The Board agreed that the following areas should be visited at an early date:

North Central Iowa and adjacent regions, Pilot Mound area, Twin Lake, Wall Lake, and Storm Lake, the largest boulder in the United States in Floyd County, Bone Yard Hollow in Webster County, Ledges in Boone County, Devil's Backbone in Madison County, Steamboat Rock, and Wild Cat Den in Hardin County; South Eastern Iowa, Red Rock, Marion County, Keosauqua, Ottumwa and adjacent regions, Wild Cat Den and Odessa Lake, Muscatine County; North Eastern Iowa, Natural Bridge in Jackson County, an area near Oxford Junction, Jones County, Dubuque, Bixby's Park, and McGregor, Waterville and Yellow River, Allamakee County, Ice Caves, Winneshiek County, Mills, Fremont and Montgomery Counties and adjacent regions in South West Iowa.

The communities where parks are desired are asked to furnish the Board with complete data of price of land, to furnish topographic maps, and give the Board information as to gifts in the way of land, etc.

Keosauqua, Iowa, July 12, 1919.

Present Messrs. Pammel, Harlan and Ford. The members having visited the region of Lee and Van Buren counties and being in company with B. F. Ketcham, Phil K. Ware and others of Farmington, inspected an area locally called "Big Duck Pond," the same being a hilly, wooded tract near the middle of which is a spring-fed shallow lake, approximately forty acres in extent, now more than two-thirds covered by a gorgeous field of lotus. The woods embrace a vast variety of plant life, for instance, of the oak species a hasty examination disclosed everything native to Iowa except the pin oak, and it is believed that even this exists.

The above named citizens and their associates proposed to the Board of Conservation that if within a reasonably near future the state would take over and administer the same, by at least repairing the dam and restoring the lake level to its former height, and by making the margins of the lake accessible by roads, the said citizens would acquire title and possession of not less than 100 acres, embracing the wood and lake areas, and present the same cost free to the state of Iowa.

They further suggest the average cost per acre would be about \$75.00.

The Board observes the dam referred to is a dirt dam approximately four feet across the top; not to exceed six feet in height; erected at some prior time but cut through by a former stream outlet. It observes that road-ways lead upon and into the lands by way of gates both from the north and south approaches. It observes that the lake itself is within 1000 yards of the Des Moines river, on the margin of which is a public highway generally traveled from the town of Athens in Missouri to Farmington, Iowa, and extending respectively to beyond these two points.

The Board considers that if the citizens will obtain the 100-acre area in such a way that it will extend all about the lake and on down its outlet to the Des Moines river, and otherwise conform to their proposition, the board considers the offer a valuable one and hereby recommends to the Executive Council the acquisition of the lands in compliance with the terms thereof.

Adjourned.

Keosauqua, Iowa, July 12, 1919.

Members present same as at the meeting at Keosauqua this date. The members having been conducted to and about the area locally known as the "Ely's Branch Country" by Messrs. H. E. Blackledge, Emory Ploughman, Arthur J. Secor, J. A. Brown and Sgt. H. E. Rees, and finding the said area a large uninterrupted expanse of native shrubs and trees, the ground deeply broken and otherwise well suited to the preservation of wild birds, animals and plants, and the same being accessible on all sides by a well traveled highway from which by-roads lead toward the center north margin, an ancient ford across the Des Moines river, and said lands being bounded for an extent of something like a mile on the north side by the Des Moines river and extending back from the river a distance of from one to three miles formerly of the character above described, and the members having observed an unusual number of quail and having observed upon a prior trip in February of the present year four different ruffed grouse, and the Board having learned that the hills and river bank above stated now and for many years have been resorted to by people residing from nearby to a distance of 20 miles as a place of recreation, and the Board having been assured by the above named gentlemen that at least 600 acres of said lands could be procured at an average cost of not exceeding \$40.00 per acre upon which purchase price they and other citizens would be willing to contribute a sum of not less than \$6,400, if the state would take the same, administer and conduct it as a game reserve and recreation ground.

In the course of the state's policy of providing and maintaining its system of state parks, and the Board considering the above described area and the proposition made concerning the same to be respectively advantageous, considers that the same should be accepted and do hereby recommend that the Executive Council do accept, acquire and improve said grounds in accordance with the terms of the offer made.

Adjourned.

Davenport, Iowa, July 19, 1919.

Present: Dr. L. H. Pammel, President; E. H. Harlan, Secretary; Joseph Kelso, member.

The Board met in session at the office of Cook & Balluff, and held conference with Miss Emma C. Brandt and Miss Clara L.

Brandt, who are the owners of the farm lands in Muscatine County, known as "Wild Cat Den" embracing some fifty-five acres, and a great part of a more extended area of high value for State Park purposes, because of its scenic, scientific and historic characteristics. The following was adopted:

Whereas, the Misses Brandt propose as follows: To deed to the State of Iowa by appropriate deeds, the tract of land above referred to, but not herein specifically described, with the understanding that the same shall be a part of a State Park, under the control and supervision of the State Board of Conservation, upon the following conditions:

1. That the State Board of Conservation shall proceed within two years, to acquire either by purchase or gift, at least seventeen acres from one Welsh and twenty acres from one Fitchner, and from the owners thereof, the land lying between the southerly line of the property now owned by the Misses Brandt to the Mississippi River, and along Pine Creek, and extending westwardly to the highway, and eastwardly to a sufficient distance from said Creek, so as to include suitable grounds on the east side.

2. That the land agreed to be donated shall always be used for a State Park and shall never be used for any commercial purposes.

3. That the native plants found on the land shall be preserved, and that the forests on the land shall be kept intact except where it shall be necessary to give place to roads and paths, and that in case of destruction or removal of any of the trees they shall be replaced by native species.

4. That the State Board of Conservation shall assume all responsibility for the proper care and protection of the land as soon as the land is delivered over to the State Board of Conservation, and that the necessary warden or keeper shall be provided.

5. That the donors of said land reserve the right of use and occupation of the buildings and surrounding land sufficient to provide a suitable yard and space for the necessary outbuildings, not exceeding seven acres and to be definitely designated and marked by appropriate monuments or fence. That this reservation shall be one of full ownership, except that the donors shall not sell, trade, or exchange the land or building, but upon voluntary relinquishment, and upon the death of the survivor of the two donors, the land and buildings shall automatically revert to the State, and become a part of the State Park.

6. That the State Board of Conservation, upon taking over the land as described, shall begin making arrangements at the earliest convenience, to make the necessary immediate improvements, entrances and exits, so that the State Park shall be open to the general public within two years from the date of the delivery of the deeds.

7. That if, at the end of two years from the date of this offer, the State has failed to begin the necessary improvements, and have not opened the park to the public, or have not taken care of same, that this deed shall then be null and void.

8. That if in the future the State Board of Conservation shall have failed to carry out the conditions enumerated herein, that the land as described shall then revert to the owners or their heirs.

9. That the said State Park when established shall be known and named as "Wild Cat Den" or some derivative thereof.

And, whereas, the above and foregoing offer is a valuable condition precedent to the creation of a suitable State Park, of which the gift is a nucleus; and

Whereas, a total area of not less than three hundred acres is desirable for such park, the use and value of which to the region surrounding of a radius of perhaps twenty miles would receive a benefit of approximately half that to the public at large, it is the opinion of the State Board of Conservation that this gift shall be accepted on the conditions made, and that in order to acquire the balance of the lands, the Board should cause the co-operation with it on behalf of the citizens in the immediate neighborhood in the following or some other practical way:

First:—The citizens should assure the Board the entire area additional to the 55 acres, which shall be acquired within one year of this date, at an average cost per acre of not to exceed dollars per acre.

Second:—Of the total cost price of lands additional to the 55 acres the citizens of the locality should contribute not less than Five Thousand (\$5000) Dollars, and the State pay the balance of the purchase price.

Third:—Upon the completion of these conditions the State should take over, improve, administer and maintain forever the area as a State Park, carrying these conditions in substance in its records, upon its maps, guides and tablets, in such a way as to carry into the most remote future, the element of philanthropy entering into the gift of the Brandt sisters.

A committee is hereby created to consist of Mr. Kelso and the Secretary, which is hereby directed to submit to the Executive Council a copy of these minutes for the tentative approval of said Council, and upon said tentative approval, the Committee is directed forthwith to proceed by personal, or other methods, to a proper arrangement with the local citizens for the prompt and effectual carrying out of the conditions hereof.

Tama, Iowa, July 21, 1919.

Present: Chairman L. H. Pammel, Secretary E. R. Harlan, Mr. Kelso, member.

The Commission being in conference with Messrs. H. T. Cherry, F. A. Solomon, H. L. Roberts, E. E. Goodell and George Austin, proceeded to examine an area embracing the reservoir, embracing some forty acres of water artificially impounded, the grounds thereabouts including the race or ditch leading thereto from a point upon the Iowa river some four miles upstream, and a number of sites of hilly, wooded character nearby.

The citizens represented to the Commission that the reservoir and all its attributes are the private property of the Cherry Co., manufacturers of straw-board products, one indispensable supply being a constant head of running water at present of a volume of 1500 gal. per minute.

It is possible an eventual requirement of 3000 gal. per minute may result from expanded business. It was represented that under the present construction and at the lowest stage of the water in the Iowa River, the said quantity of 1500 gal. is regularly delivered together with an additional volume wasted over the retaining embankment of the full actual amount. In other words, there is always flowing fully 3000 gal. per minute of which the half only is at present required.

It was further represented that said flow of water possibly embraces some power value.

It was represented to the Board that the citizens are ready and willing to turn over to the Board the reservoir, ditch and grounds going therewith of a width from the water's edge of not less than 100 feet in all directions except where the railroad embankment forms part of the retaining wall, provided the State would convert the same into a recreation ground or park, and would deliver the Cherry Company a maximum of 3000 gal. per minute or as much thereof as the flow of the Iowa River, under proper control, will supply; and provided that if said Cherry Company in future desire, they may, without interference of the State, use of the stream or reservoir, produce power therefrom.

The Board, taking into account the peculiar interest to the public at large of the Musquakie Indians on their reservation of some 3600 acres of land through which the Iowa River and the Lincoln Highway run, both of which are approximately parallel with each other and with the Milwaukee and North Western Railroads from the dam in the Iowa River on this Indian Reservation to the city of Tama, are of the opinion that what ever shall be done with respect to a state park or any reservation on the part of the State, ought to recognize the quality of interest proposed by the Indian reservation and so establish and direct the state's interests as to afford some benefit to the Indians on the reservation as well as derive benefit therefrom. Therefore, the Board directed its Secretary to take up and pursue with the Indians and all other necessary authorities, a plan of connecting with any use that may be made of the aforesaid water and its surroundings, with the Indian Reservation as such.

It is suggested by the Secretary that he ascertain whether the Indians could and would be willing to give over to the State of Iowa for at least an experimental period of five years, the use of not less than fifty acres of their lands not now in cultivation and lying as near to the Iowa River dam as they will allow, reaching up to and over the high lands, and if there is no impediment to this arrangement whether the state would be empowered to use such lands as its own upon a demand of a reasonable rate of interest upon the actual value of the lands.

The Board further considered that if no suitable arrangement could be made to the satisfaction of the Indians and to this Board, that then an area of some 50 or 60 acres lying contiguous or convenient to said reservation, Lincoln Highway and supply ditch of said reservoir, at a minimum cash value, be acquired.

And it appearing that the question of providing and maintaining the required flow of water for the use of the Cherry Company implies a study and conclusion with regard to the difficulty and expense of the necessary engineering and constructing elements, particularly of the erection and maintenance of a suitable dam, the dredging and deepening of the ditch and lake, and the widening of the embankments call for a considerable amount of technical investigation of which the Cherry Company already has conducted a part, if not the whole, it is by the Board therefore

Requested that the citizens of Tama accepting the assurance of the Board that the project of making a state park of the natural and artificial elements investigated, procure and submit to this Board a complete investigation and survey with plans, specifications and estimates such as would be demanded by any conservative and substantial person looking to the establishment of this project as a commercial enterprise, and especially for the construction of a suitable dam in the Iowa River, the deepening and widening of the race or ditch, the widening of the embankment and the dredging of the lake, all so itemized that the Board would be advised with respect to one without necessarily considering the other elements of this problem. Also, it is requested of these citizens that they advise further, if the Board finds it cannot recommend the taking over of the reservoir and the ditch and the provision of the necessary construction and maintenance to produce a suitable recreation enterprise, the citizens would provide cost free to the State, the area of eighteen acres south of the reservoir, so well suited for the creation of

a garden of wet land, trees, shrubs and flowers, and also in case the Secretary of this Board shall fail to procure a suitable concession of Indian lands, a further area conveniently near the Indian Reservation and to the Lincoln Highway and the reservoir, or lake should be acquired. If said citizens are unable to assure the Board the delivery cost free of both the eighteen acre tract and the hill land—if the Secretary fail to obtain the Indian lands—then it is requested to know what maximum amount of money would be required of the State to pay for either or both of these tracts and what percentage, if any of the purchase price would the citizens engage to bear.

The Board considers that owing to the complicated character of this opportunity but the extraordinary interest thereof, it is justified in asking the fullest participation on the part of the citizens of Tama in the preliminary investigation and in its final solution.

The Secretary will certify these minutes to the Executive Council as an indication of the policy of the Board with respect to the Tama area and as an evidence of its good faith to the citizens of Tama.

McGregor, Iowa, July 28, 1919.

Present: Gov. Harding and Treasurer Hoyt of the Executive Council, Chairman Pammel, Secretary Harlan, Mr. Kelso, Mr. Ford, Asst. Secretary Mott, Fish and Game Warden Albert, Asst. Warden St. John and others. Meeting held at the office of F. G. Bell.

Mrs. Viva Dutton, of Charles City, was present and addressed the meeting upon the subject of the reservation of the notable granite boulder near Charles City. A motion by Mr. Kelso was adopted referring the matter to Dr. Pammel and Mr. Ford to investigate and report.

Mr. Cooper of Boone, representing the Commercial Club of that city, presented the subject of acquiring the area known as "The Ledges" near that city. The substance of the Board's response was that a considerable area should be acquired there embracing the Ledges and sufficient ground to perpetuate natural plant and animal life and room for the parking of cars in large numbers and for every element of recreational grounds. Mr. Cooper was further advised that inasmuch as a large proportion of the benefit expected to result would be to an area roughly

estimated for a radius of twenty miles, it would be only fair if within such radius there be raised a portion of the purchase price of the lands, and that all the lands be tendered the state free from excessive values and clear of litigation and all other embarrassing details. The board accepted Mr. Cooper's suggestion that it would in the fall meet with his club and canvass the matter.

Mrs. H. J. Taylor, of Sioux City, appeared before the Board, petitioning orally, asking that additional grounds to Stone Park be secured and saying the business men of Sioux City represent to her that the city will turn over Stone Park to the State if this additional ground be secured by the State. Mr. Ford and Dr. Pammel were appointed to investigate this matter.

Dr. Pammel asks that the Board investigate the Big Springs and the Balsam fir grove in Allamakee County and that arrangements be made to acquire this area.

Dr. Pammel reports that Hon. Ellison Orr and others of Allamakee County urge that this area be preserved, at least that the stock be kept out until the area be acquired.

There was also a similar request as to the Pine groves near Waterville. The Board appointed Messrs. Harlan and Pammel a committee to which these areas were referred.

Motion was passed requesting the Executive Council to approve the Board's recommendations for acquiring the Keosauqua and Farmington areas.

Motion was passed that the Board authorize the attendance at the McGregor meeting of Assistant Secretary Mott and of stenographer, Miss Scott.

Motion passed directing Chairman Pammel, Secretary Harlan and W. E. Albert to draft and promulgate temporary rules to govern Backbone Park.

Motion passed appointing Chairman Pammel and Secretary Harlan a committee on the naming of parks.

Motion passed requesting the Executive Council to furnish the Board with a map or survey of the Backbone area.

Motion passed giving Dr. Pammel authority to make an exhibit at the State Fair.

Motion passed authorizing Mr. Kelso to negotiate for the Morehead Caves area.

Motion passed appointing Dr. Pammel and State Fish and Game Warden Albert a committee to investigate and report what action should be taken by this Board with reference to

areas around Clear Lake, Okoboji, Spirit Lake, Twin Lakes and other lakes and to report.

The following resolution was, by motion of E. R. Harlan, adopted:

That lake park areas should be treated as follows:

- (a) Where the acquisition of areas is solely the question, these be automatically for the attention at convenience of Chairman Pammel and Warden Albert, to report to this Board.
- (b) Where the matter relates to dams, water levels, riparian or other rights, dredging, reclamation or other matters involving the authority and responsibility of one or more of the following:

The Executive Council;

The Fish and Game Department;

The Board of Conservation;

The county, municipality or drainage districts in the respective regions, the Secretary of this Board shall assemble every question, arrange an itinerary in the month of October on which all the bodies named or representatives thereof shall proceed to the respective areas and after ample public notice confer with all concerned and jointly or severally the bodies dispose of the questions as they may be presented.

SENTIMENTS ON
RECREATION PLACES

GEORGE W. CLARKE
W. L. HARDING
JOHN F. LACEY
FRANKLIN K. LANE
FRED J. LAZELL
THOMAS H. MACBRIDE
STEPHEN H. MATHER
MARK TWAIN

SENTIMENTS ON RECREATION PLACES

NATURE WAS KIND TO IOWA

From Inaugural Address of Gov. Wm. L. Harding, January 16, 1919.

Nature was in a most pleasant mood when our land was fashioned. She bounded us by two mighty rivers, here ever to be harnessed for power unlimited. She pencilled the landscape for beauty and utility. She left lake, and stream, and wooded hill, she gave forest and prairie for the pioneer, and coal to turn the wheels of industry.

Life in abundance was hid in the soil, waiting only the hand of the plowman and springtime's gentle kiss to blossom into a harvest abundant to feed a hungry world.

Here can be builded a civilization fashioned in the image of the Maker and translated into reality by the genius of man that shall be peer and leader of all the world.

Play spots are necessary in building a permanent state. Men and women are but children grown up. Heart joys and heartaches are common to us all. Sentiment and tradition are threads that hold us steady and bring us back to the old homestead or the place of our birth.

PEOPLE URGED TO PLANT TREES

From Arbor Day Proclamation of Gov. George W. Clarke, made February 4, 1913.

John Ruskin said: "While I live, I trust I shall have my trees, my peaceful idyllic landscapes, my free country life—and while I possess so much, I shall own 100,000 shares in the Bank of Contentment." How we love the trees that sheltered our childhood! Some of the finest, sweetest memories of life are there. The tree that we planted with our own hands many years ago, now strong against winter storms and beautiful in summer sunshine, what a sense of proprietorship and inexpressible comfort we have in it.

"Oh, have you seen on a wayside slope
The elms and maples, with branches high,
That some one planted, in faith and hope
Far back in the silent years gone by?

"Oh, not in vain there were left in trust
To a later age the trees he set;
When he who planted is turned to dust,
The good that he wrought survives him yet."

Then plant a tree. Let the children plant trees. Let a day be designated when all Iowa shall plant trees on the public school grounds.

Thirty years ago the legislature enacted, "The board shall cause to be set out and properly protected twelve or more shade trees on each schoolhouse site where such trees are not growing." If this statute has sometimes been forgotten, it is well to revive the memory of it. How fine it would be if the public generally, especially in the smaller towns and cities, under competent direction, would, with the schools, devote a day to the question of beautifying public parks and grounds.

THE BEAUTY OF GREAT TREES

From a Proclamation by Gov. George W. Clarke.

In an article in *The Register and Leader* of February 22, 1914, entitled "The Forests of Iowa," Mr. H. C. Evans, of Des Moines, said:

"There is an old elm in the yard of the J. J. Selman home in Bloomfield that is probably the largest tree in the state. The writer has had intimate acquaintance for over fifty years with another old elm a few miles northeast of Bloomfield. This tree was a monarch of the forest ere the white man set foot on Iowa soil. It was known to the Indian and the wild beast a hundred years before the independence of our country. It is probably three hundred years old. It reached its splendid proportions through great tribulations, in spite of wind and weather. We have seen its splendid branches whipped almost to the breaking point by terrific winds. It stands so high above surrounding objects that twice it has attracted the lightning and it is scarred from tip to base. For more than seventy years children have found a playground beneath its shade. It has withstood drouths and storms, the rigors of many winters, the assaults of men and nature—and has not its fellow in beauty and grandeur for miles around. There is majesty and gripping pathos about a great tree. There is mystery about its everlasting silence, its tranquil patience."

How fine, how great a thing it would be to plant a tree to withstand the storms and beautify landscapes and shelter and refresh by its shade for centuries. Plant trees on the schoolgrounds of Iowa. Keep a record of the planting—when and by whom—that future generations may call your name blessed. All is for the future. Remember that and contribute something to make life in the coming years desirable, beautiful, great. Fail not to do so in many ways, but plant trees.

NEED OF RECREATION

By Mark Twain, American Humorist and Author.

We walked up and down one of the most popular streets for some time enjoying other people's comfort and wishing we could export some of it to our restless, driving, vitality-consuming marts at home. Just in this one matter lies the main charm in Europe: comfort. In America, we hurry, which is well; but when the day's work is done, we go on thinking of losses and gains, we plan for the morrow, we even carry our business cares to bed with us, and toss and worry over them when we ought to be restoring our racked bodies and brains with sleep. We burn up our energies with this excitement and either die early or drop into a mean and lean old age, at a time of life they call a man's prime in Europe. When an acre of ground has produced long and well, we let it lie fallow and rest for a season; we take no man clear across the continent in the same coach in which he started; the coach is stabled somewhere on the plains and its heated machinery allowed to cool for a few days; when a razor has been long in service and refuses to hold an edge, the barber lays it aside for a few weeks and the edge comes back of its own accord. We bestow thoughtful care upon inanimate objects but none upon ourselves. What a robust people, what a nation of thinkers we might be, if we would only lay ourselves on the shelf occasionally and renew our edges.

BEAUTY OF RETURNING SEASONS

By Mark Twain, American Humorist and Author.

The land that has four well-defined seasons cannot lack beauty, or pall with monotony. Each season brings a world of enjoyment and interest in the watching of its unfolding, its gradual, harmonious

development, its culminating traces—and just as one begins to tire of it, it passes away and a radical change comes, with new witcheries and new glories in its train. And I think that, to one in sympathy with Nature, each season, in its turn, seems the loveliest.

No land with an unvarying climate can be very beautiful. The tropics are not, for all the sentiment that is wasted on them. They seem beautiful at first, but sameness impairs the charm by-and-by.—“The Innocents at Home.”

OUR PLAYGROUNDS WITHOUT RIVALS

By Franklin K. Lane, Secretary of Interior.

To build a railroad, reclaim land, give new impulse to enterprise, and offer new doors to ambitious capital—these are phases of the ever-widening life and activity of this nation. The United States, however, does more; it furnishes playgrounds to the people which are, we may modestly state, without any rivals in the world. Just as the cities are seeing the wisdom and necessity of open spaces for the children, so with a very large view the nation has been saving from its domain the rarest places of grandeur and beauty for the enjoyment of the world.

OUR RICH NATURAL SCENERY

By Stephen T. Mather.

This nation is richer in natural scenery of the first order than any other nation; but it does not know it. It possesses an empire of grandeur and beauty which it scarcely has heard of. It owns the most inspiring playgrounds and the best-equipped native schools in the world and is serenely ignorant of the fact. In its national parks it has neglected because it has quite overlooked, an economic asset of incalculable value.—“The National Park Portfolio.”

GIVE BEAUTY ITS RIGHTFUL PLACE

By Thomas H. Macbride, President State University of Iowa.

Iowa once a park of splendor from river to river will be so again when ten million fortunate people, on some future day, shall each give beauty rightful place in the conduct of all successful living. Hail Iowa!—Greetings to Iowa Forestry and Conservation Association.

PRESERVE THE TREES

By John F. Lacey, Congressman.

Now I only speak about this, my friends, because it is a kindred question. It is one of the things that grows out of the agitation of forestry. A man or woman who preserves a tree in a practical way will preserve the things which that tree shelters and produces and that are useful to man. Again, I wish you God-speed, and I hope you will carry with you to every part of the United States the enthusiasm which you will generate here—the enthusiasm which you will convey to one another—and that you will be a mighty band of missionaries all the way from Portland, Maine, to Portland, Oregon.—“Lacey Memorial Volume,” p. 97.

The United States government tardily recognized the necessity of preserving as public property some of the great wonders of nature. The Yellowstone National Park was the first one of these reservations thus set apart as a national resort. Since then the public lands around the Yosemite have been embraced in a national park. Efforts are being made to save the big trees of California from the saw of the lumberman. Mt. Ranier has become a park and its natural scenery preserved from mutilation.—“Lacey Memorial Volume,” p. 207.

Forestry has found some difficulty in attracting attention, because of the assumption that the subject is purely one of sentiment. It is true that sentiment does attach to the preservation of our forests. But the subject is in the highest degree one of practical utility. It is commonly true that there is an esthetic side to all practical and useful subjects. The poet and the painter may rejoice in the contemplation of the woods. But the farmer, the miller, the boatman, and the lumberman may now combine to preserve as well as to enjoy the beneficial uses of this great element of our national wealth.

A vigorous and healthy forest is the height of nature's adornment. We have always been sensible to its beauty; we are now deeply concerned in its utility. The forests have always been modest in their requirements. All they have asked for has been standing room. Give them but place and they will do their work patiently. Their long arms have reached out for ages and gathered from the air the elements of growth, which they have added to the soil.—“Lacey Memorial Volume,” p. 88.

GOD'S GREAT OUT-OF-DOORS

By Frederick J. Lazell, Author.

It is indeed a pleasure thus to open the gate while my friend leads us away from the din and rush of the city into "God's great out-of-doors." Having walked with him on "Some Winter Days," one is all the more eager to follow him in the gentler months of spring—that mother season, with its brooding pathos, and its seeds stirring in their sleep as if they dreamed of flowers.

Our guide is at once an expert and a friend, a man of science and a poet. If he should sleep a year, like dear "Old Rip," he would know, by the calendar of the flowers, what day of the month he awoke. He knows the story of the trees, the arts of insects, the habits of birds and their parts of speech. His wealth of detail is amazing, but never wearying, and he is happily allusive to the nature-lore of the poets, and to the legends and myths of the woodland.—"Some Spring Days in Iowa."

The majority of Iowa people still find pleasure in the simple life, still have the love for that which nature so freely bestows. They find time to look upon the beauty of the world. Many a busy man finds his best recreation in the woods and fields. It may be only a few hours each week, but it is enough to keep the music of the flowing ever in his ears and the light of the sunshine in his eyes. It is enough to give the men and the women of the state wholesome views of life, happy hearts and broad sympathies. Some few find in the woods and fields thoughts and feelings which are, to them, almost akin to religion. If this little book helps such lovers of the out-of-doors ever so little; if it shall help others to see for themselves the beauty and the joy and the goodness of this world in which we live, the author will feel that it has been worth while.—"Some Summer Days in Iowa," p. 8.

But one need not go to Concord to find Walden woods and ponds. Had Thoreau lived in Iowa he could have written just as richly, and had Bryant's home been on the hither side of the Father of Waters he would have sung just as sweetly. By and by some writer with the learning of a naturalist and the soul of a poet shall tell of the beauties in this great garden of Eden which is embraced by two mighty rivers and is filled with the color and perfume of the rarest flowers and the music of the sweetest of the singing birds. Well might the Indians call this state "Ioway, Ioway, beautiful land."—"Some Autumn Days in Iowa," pp. 5-6.

Humanity has always turned to nature for relief from toil and

strife. This was true of the old world; it is much more true of the new, especially in recent years. There is a growing interest in wild things and wild places. The benediction of the Druid woods, always appreciated by the few, like Lowell, is coming to be understood by the many. There is an increasing desire to get away from the roar and rattle of the streets, away from even the prime formality of suburban avenues and artificial bits of landscape gardening into the panorama of woodland, field, and stream. Men with means are disposing of their palatial residences in the city and moving to real homes in the country, where they can see the sunrise and the death of day, hear the rhythm of the rain and the murmur of the wind, and watch the unfolding of the first flowers of spring. Cities are purchasing large parks where the beauties of nature are merely accentuated, not marred. States and the nation are setting big tracts of wilderness where rock and rill, waterfall and canon, mountain and marsh, shell-strewn beach and starry-blossomed brae, flowerful islets and wondrous wooded hills welcome the populace, soothe tired nerves and mend the mind and the morals. These are encouraging signs of the times. At last we are beginning to understand, with Emerson, that he who knows what sweets and virtues are in the ground, the waters, the plants, the heavens, and how to come at these enchantments is the rich and royal man. It is as if some new prophet had arisen in the land, crying, "Ho, everyone that is worn and weary, come ye to the woodlands; and he that hath no money let him feast upon these things which are really rich and abiding." While we are making New Year resolves let us resolve to spend less time with shams, more with realities; less with dogma, more with sermons in stones; less with erotic novels and baneful journals, more with the books in the running brooks; listening less readily to gossip and malice, more willing to the tongues in trees; spending more pleasurable hours in the music of bird and breeze, rippling rivers, and laughing leaves; less time with cues and cards and colored comics, more with cloud and star, fish and field, and forest. "The cares that infest the day" shall fall like the burden from Christian's back as we watch the fleecy clouds or the silver stars mirrored in the waveless waters. We shall call the constellations by their names and become on speaking terms with the luring voices of the forest fairyland. We shall "thrill with the resurrection called spring," and steep our senses in the fragrance of the flowers; glory in the gushing life of summer, sigh at the sweet sorrows of autumn, and wax virile in winter's strength of storm and snow. "Some Winter Days in Iowa," pp. 9-11.



PURCHASED OR
CONSIDERED AREAS

Backbone Area, Delaware County.

CALVIN, SAMUEL
CARR, E. M.
LEES, JAMES H.
PAMMEL, L. H.
SMALL, MRS. W. B.

Buckingham Lake, Mills County.

DEAN, SETH
PAMMEL, L. H.
UDDEN, J. A.

Lower Des Moines Area.

GORDON, C. H.
HARLAN, E. R.
PAMMEL, L. H.

Moorehead Caves, Jackson County.

HOUSE, MRS. A. J.
LEES, JAMES H.
PAMMEL, L. H.
SAVAGE, E. T.

Wild Cat Den, Muscatine County.

PAMMEL, L. H.
REPPERT, FERDINAND
UDDEN, J. A.

PURCHASED OR CONSIDERED AREAS.

REPORT OF THE BACKBONE AREA.

By L. H. Pammel, Botanist.

The Devil's Backbone, in Delaware County in northeastern Iowa, has become somewhat famous because of the geologic investigations made by McGee in his exhaustive memoir on the Pleistocene history of northeastern Iowa. (Rep. U. S. Geological Survey, 1891:189-577). The earlier work of David Dale Owen in 1839 who made a (Rep. of the Geological Exploration of part of Iowa, Wisconsin and Minnesota, 1844) report on the mineral lands, soils, timber and rock. Many years later the lamented Dr. S. Calvin made an investigation of the unique topography, geology and fossils of the region. (Iowa Geo. Survey 8:121-192). Dr. Calvin in describing this region says:

"The region in Richland township includes the somewhat noted locality known as the 'Backbone.' The Backbone is a high rocky ridge around which the Maquoketa forms a loop. The summit of the ridge rises from 90 to 140 feet above the stream. Its sides are in places precipitous, the rocky cliffs rising sheer for more than 80 feet. Erosion and secular decay have carved the rocks into picturesque columns, towers, castles, battlements and flying buttresses. The exposed surfaces are deeply pitted and weather worn. Crevices, widened by protracted chemical action of air and water, are wholly or partly filled with dark brown residual clay or geest. The stream, on each side of the ridge, flows in a deep valley. The 'Backbone' with its valleys on the east and west is a bit of Driftless area, and the sections north of the Backbone, namely, 3, 4, 5, 8, 9 and 10, as well as the region to the southeast between the center of section 16 and Forestville, and southward along the river to section 34, constitute a region of loess-Kansan topography."

The deep valleys of the Richland highland as well as the similar valley of the north Maquoketa resemble canyons of pre-glacial origin.

There is no drift, at least there is none of Iowan age. The exposures occur on hills through which the Maquoketa flows in a gorge 200 feet in depth. The hills rise eighty to one hundred feet above the adjacent portions of the Iowan drift plain, and the region is one of many that give very positive indications of the fact that in Delaware county the Iowan ice did not overflow eminences that rose a few score of feet above the general level. The region is rich in fossils, Dr. Calvin says: "At the Backbone, in section 16 of Richland township, the vertical cliffs, eighty to ninety feet in height, show the following section:

	Feet
4. Pentamerus beds, massive and weathering irregularly.....	25
3. Band of chert, with casts of Pentamerus.....	1
2. Pentamerus beds, like No. 4.....	43
1. Massive beds, without Pentamerus, but containing colonies of Halysites catenulatus and Syringopora tenella.....	20"

Some fifty kinds of fossils have been found in this region.

Alluvium covers the flat bottom of the valley through which the Maquoketa flows at the Backbone.

The trees and timber of the region are of interest. There are as many species in this small area as in any other similar area in north-eastern Iowa. White pine—the white pine are among the largest and oldest native white pine in the state. I saw a stump there which was nearly four feet in diameter and I should judge that these trees go back to the time when Iowa belonged to France. The Indians protected these trees and why should we not do the same. Common juniper, red cedar, American yew, three poplars—the quaking aspen, large-toothed aspen and cottonwood—. Five species of willow as black willow, almond-leaf willow, prairie willow, pussy willow and dwarf-gray willow. Of the oaks the following are: Chestnut, bur, red, white, quercitron and barren. Some of the old oaks, perhaps one hundred and fifty years old are still standing. It is the fervent desire of scientists that they be preserved. The blue beech, ironwood and paper birch occur. Of the nut bearing trees, the butternut, black walnut, shell-bark hickory, pig-nut and hazelnut. The sycamore also occurs. This is a very rare tree in northern Iowa. There are three elms, the American, slippery, cork or rock elms, also the hackberry, the leatherwood—a beautiful early, blooming shrub with numerous yellow flowers also occur. The common elder, abundant and the less common red berried elder, the high bush cranberry, arrowwood and snowberry, and two honeysuckles are interesting shrubs found in this region. There are four dog-woods—the rare round leaved dogwood, silky cornel, red osier and the alternate-leaved dogwood is abundant over the hills. There are three species of goosberries and wild currants. The prickly and smooth gooseberry and the wild black currant.

The Rose family is represented by the common red raspberry, wild white rose, wild crab and five species of wild red haws and the service berry. Wild black cherry, choke cherry and pin cherry, the wild plum and nine bark. The honey-locust, coffee-bean, and the false indigo are common in this region.

There are three species of sumac—the poison ivy, the beautiful stag-horn sumac and the common sumac.

There are some very fine specimens and many of them of hard maples or the black maple and the common hard maple, the silver maple and the boxelder.

The bladdernut is also frequent. The Virginia creeper and wild grape found everywhere as is the climbing bitter sweet; there are also many specimens of the burning bush or wahoo.

The prickly ash is distributed everywhere along this stream.

There are fine specimens of the basswood.

The walking-leaf fern, spleenwort, maiden hair fern and bracken are common in this region.

Of other herbaceous plants, mention may be made of the moccasin flower, trillium, Jack-in-the-pulpit, violets, spring beauty and other plants are abundant.

THE BACKBONE OF DELAWARE COUNTY.

By James H. Lees, Geologist.

Just now, when friends of conservation in Iowa are interested in the purchase of the land adjacent to the Backbone, in Delaware county, they may welcome some statements regarding the physical features of a region which is remarkable, alike in its own character and in its relation to the surrounding county. The Backbone region is a rugged island rising out of the gently swelling sea of the Iowa prairie. It is a bit of the "oldland" which elsewhere is hidden by the mantle of the newer glacial drift. Amid its deep valleys and precipitous cliffs one imagines himself, and rightly, in a land of ten thousand centuries. Clambering to the level of the nearby upland he looks over a plain which has been barely touched by the graving tools of Nature.

Geographically the Backbone is situated almost in the center of Richland, the northwestern township of Delaware county. It is thus in close proximity to four counties, Delaware, Buchanan, Fayette and Clayton. Its location makes it easy of access from numerous towns and villages round about—Manchester, Strawberry Point, Independence, Oelwein, Fayette, West Union—from these and many others it is within easy reach, a feature which adds much to its desirability and utility. As indicated before, although it is surrounded by the nearly level or gently rolling prairie so characteristic of Iowa, the Backbone region itself is exceedingly rugged and rough—a bit of the driftless area. The Backbone proper is a long narrow ridge lying within a loop of Maquoketa river, which bends back upon itself to the north for a distance of half a mile or more and then, again making a turn to the southeast, resumes its normal course. Above the waters of the stream the rocky cliffs rise vertically to heights of eighty to a hundred feet, while the more distant hills stand sixty to a hundred feet still higher. The rock walls of the valley are dotted and surmounted by occasional clumps of the rare white pine or the red cedar, which seem to seek the most barren spots for their foothold. The level flood plain with its carpet of grass and the grateful shade of its forest covering offers a tempting resting place for tourist or camper. If one wishes to climb to the summit of the Backbone, an easy path offers itself or the more venturesome may ascend the "stairway" a great crevice in the rocks, widened through the ages by solution and decay, until now it affords a dizzy passage for the clear of head and strong of limb. From long exposure to the forces of Nature the rocks have been carved into towers and columns and battlements and all the picturesque forms which such materials assume under the touch of Time.

To the student and lover of nature, the history through which a region has passed is always interesting and enlightening. One learns to appreciate more fully scenic features through a knowledge of the processes and vicissitudes by which they have attained their present forms. So we may well afford to look back into the past and see the evolution of the Backbone with its contiguous territory. We shall see it eons ago as it lay beneath the Silurian sea and was being built up by the slow accumulation of the beds of limestone which now forms its mass and out of which the river gorge has been cut. On the sea floor were multitudes

of the life forms of the time, forms which dying left their shells on the bottom and in the muds beneath. These shells and their casts today bear clear witness to the abundance of the life of those days, as the accompanying figure shows. When we realize that these types persisted so long that their fossil remains are found through sixty feet of limestone we can understand what hosts there must have been.

Once and again in all probability the seas covered our area, but the materials which were spread over their floors have long since been swept away, at least from the particular region with which we are now concerned. Rocks of the Devonian period are present in southwestern Delaware and the southwest half of Buchanan counties, and unquestionably they once extended much farther to the northeast. Whether the seas of Mississippian or later ages advanced thus far to the northeast we do not know. However, for age upon age, northeastern Iowa, as a part of a great central land-mass, lay exposed to all the destructive forces of nature until its once level plains were dissected into deep valleys and high hills. Then the great Nebraskan continental glacier advanced from the north, crept over these hills and valleys and buried them beneath its load of debris. In time the long winter merged into spring, the ice cap disappeared and vegetation covered the bare gray plains. After a long interval a second glacier, the Kansan, gathered its forces in the far north and again covered valley and hill and plain with its icy mantle, and, melting away in turn, left its load of glacial drift spread over all the invaded lands. Upon these filled up and leveled off plains young streams at once set to work and in time cut a new series of valleys, very largely if not entirely independent of former systems of drainage.

The third glacier of the series, the Illinoian, did not reach the Backbone region, but the fourth one, the Iowan, coming from the northwest, extended beyond the Backbone and across most of Delaware county. A remarkable feature of this glacier was that it seemed to have avoided certain areas in its path, as is evident by the absence from them of any drift of Iowan age. The Backbone is in one of these areas and so it is that while all about are smooth gentle slopes and shallow swales of the Iowan area, within the Backbone region itself are the deep-cut valleys and vertical rock-walled cliffs of the Kansan drift area and of the Driftless area to the northeast. The reason for these anomalous conditions probably lies in the fact that the Backbone region rises above the surrounding country, that while its hills and ridges reach heights of 1,150 to 1,200 feet above sea level, in the country round about similar altitudes are not reached for several miles distant to the north and northwest. Thus the Iowan glacier, which carried only a light load of debris, and which probably was itself but a thin sheet of ice, was unable to surmount these outstanding prominences and never covered them with its veneer of mingled clay and gravel. However, there was laid down over these rugged hills a layer of fine wind-blown dust known as loess which covers but does not conceal the topography of an older time.

The question naturally arises as to the reason for this great loop in the river which causes the Backbone. The most probable answer seems to be that when drainage began on the level Kansan drift plain its course

was formed without reference to the solid rock beneath the drift covering but was determined entirely by the features of the surface. In the case of Maquoketa river these features forced the stream over a buried pre-Kansan hill of rock where the Backbone is now located. Some irregularities in the region, either on the surface of the Kansan drift plain, or which seems less likely, in the rock surface after the stream had cut down to it caused the river to assume a sharply winding course and these windings have doubtless been accentuated with the development of the valley. The Iowan drift was so thin that it could not entirely conceal the valleys which it occupied and hence after the retreat of the Iowan ice the Maquoketa may have resumed its former course across the Iowan plain and through the Backbone region. Of course the possibility must be kept in mind that the valley may date from post-Nebraskan time, but there seems to be no definite evidence in regard to this. Both above the Backbone region and below it the river is flowing through a broad, shallow drift-covered sag valley, which is in striking contrast with the deep rock-cut canyon that so nearly surrounds the Backbone. This beautiful spot, charming alike in its contrasts and in its many picturesque features, stands as perpetual testimony to the effectiveness of the geologic forces and the variety of the geologic activities which have been engaged in its sculpturing and completion for our enjoyment and benefit.

SUPPLEMENTARY REPORT OF THE DEVIL'S BACKBONE.

By L. H. Pammel, Botanist.

In my visit to the Devil's Backbone last fall and in December it was impossible for me to entirely cover the area and thus comment on all of the desirable features of the area. The matter of purchasing the land has certainly been put in the hands of a most trustworthy man, Mr. Hoyt, who not only knows every foot of the land but the many springs and desirable features. He has performed his duties in an eminently and highly satisfactory way. When the land is too high three appraisers, Senator Newberry, of Strawberry Point, Judge Dunham, of Manchester, and Mr. Abbott, of Lamont, have appraised the land. The eminent fairness of these men and their good judgment puts the matter in such shape that the state will be greatly benefitted by their wise judgment.

A point not brought out in previous reports is the accessibility of the park to the people of Lamont, $4\frac{1}{2}$ miles; Strawberry Point, 3 miles; Manchester, 14 miles. The acquiring of the large spring on the spring branch of the Maquoketa river and the adjacent bluff land will prove to have been a very wise plan on the part of the Conservation Board and Executive Council. The water of the spring is about the same during the entire year and of the same temperature winter and summer, clear, sparkling water coming out at the base of a limestone outcrop. The bluffs on both sides of the stream are well wooded. Some of the original trees of white, red, bur and barren oak, white pine, red cedar, hard maple, hackberry, basswood, ash, hickory still hardy, although much of this is of second growth trees of oak, maple, basswood, red cedar, white, slippery and corky elm and bark elm. The steep rocky bluffs in some places

are covered with ground hemlock or yew and ironwood, blue beech and red cedar. It is interesting to note that a white oak, two feet in diameter was 96 years old or that it was a seedling during the period of Long's exploring expedition. We were also able to count the annual rings on two white pine stumps cut a few years ago. The diameter of the first tree was 3 feet 2 inches. This was a seedling during the revolutionary war. A second tree was 140 years old, therefore a seedling during the revolutionary war. The diameter of this tree was 3 feet 4 inches. These trees stood on one of the banks of Spring Branch. There are other trees equally as large on the Maquoketa. The diameter of one of them was 3 feet, 3 inches, and it was 60 feet high. There are a few trees with a slightly greater diameter, and perhaps 75 feet high. A rough estimate places the white pine trees left standing at 200. They add a charm to the whole region. Of course, there are hundreds of quaking aspen and large-toothed aspen. One of the fallen large-toothed aspen, (poplar), was 52 feet long. This tree is as common as the quaking aspen. The area also contains thousands of red cedar, white and red oak, basswoods, slippery elms, bur oaks and a few chestnut oaks. The woods were covered with a fine display of spring flowers, anemone, rue anemone, blue and yellow violets, columbine, lungworts, Saint Jacobs ladder, sweet williams, hepatica, blood roots, dutchman's breeches, painted cup, lousewort, everlasting wild ginger. The list of plants collected by me is appended herewith.

- Ulmus racemosa*, Corky bark elm.
- Phlox divaricata*, Sweet William.
- Amelanchier canadensis*, Service berry.
- Carpinus americana*, Blue beech.
- Ribes gracile*, Smooth gooseberry.
- Ribes cynosbati*, Prickly gooseberry.
- Ribes floridum*, Black currant.
- Sanguinaria canadensis*, Blood root.
- Salix cordata*, Pussy willow.
- Trillium erectum* var *declinatum*, Trillium.
- Viola cucullata*, Blue violet.
- Viola pubescens*, Yellow violet.
- Rhus typhina*, Staghorn sumach.
- Juniperus virginiana*, Red cedar.
- Asarum canadense*, Wild ginger.
- Taxus baccata*, Yew.
- Ostrya virginica*, Ironwood.
- Anemone nemerosa*, Wind flower.
- Polemonium reptans*, Saint Jacob's ladder.
- Claytonia virginica*, Spring beauty.
- Anemonella thalictroides*, Rue anemone.
- Mitella diphylla*, Bishop's cap.
- Luzula campestris*, Rush.
- Prunus americana*, Wild plum.
- Castilleja coccinea*, Paint brush.
- Dicentra cucullaria*, Dutchman's breeches.
- Isopyrum biterminalatum*, False rue anemone.
- Pyrola secunda*, Shin leaf.
- Hepatica auctiloba*, Hepatica.
- Arabis laevigata*, Mustard.
- Populus grandidentata*, Large toothed aspen.
- Uvularia grandiflora*, Bellwort.

Might I suggest that during the summer plans should be made for a road leading to the park from the Lamont and Manchester side of the park; also that before next summer we should make arrangements with Professor G. B. MacDonald to reforest the depleted area with native species. I noticed in some places young white pines are coming up, showing that when given a chance native species will recover the ground.

GEOLOGY OF DELAWARE COUNTY.

By Samuel Calvin, Geologist.

Inside the Iowan area, and surrounded on all sides by Iowan drift, are two anomalous regions that seem not to have been invaded by Iowan ice. One of the regions occupies the central part of Richland township and may be called the Richland highlands. The other embraces three-fourths of Delhi township, and parts of Milo, North Fork, South Fork and Union townships and may for convenience of reference be named the Delhi plateau. The regions in question seem to have been islands in the midst of the Iowan glacial sea. At all events they contain no Iowan drift. The topography is erosional, partly resembling the loess Kansan type, partly that of the driftless area. Except in the stream valleys the surface is on the average higher than that of the Iowan drift plain, the difference in elevation ranging from forty to more than a hundred feet. Both areas are traversed by the Maquoketa river. In each there are heavy bodies of loess exhibiting the rounded hills, steep slopes and sharp valleys that result from erosion of this peculiar deposit. In each there are spaces, free from both loess and drift, in which steep rocky cliffs, isolated towers, and all other features of driftless area topography are characteristically developed.

The region in Richland township includes the somewhat noted locality, the "Backbone." The "Backbone" is a high rocky ridge around which the Maquoketa forms a loop. The summit of the ridge rises from 90 to 140 feet above the stream. Its sides are in places precipitous, the rocky cliffs rising sheer for more than 80 feet. Erosion and secular decay have carved the rocks into picturesque columns, towers, castles, battlements and flying buttresses. The exposed surfaces are deeply pitted and weather worn. Crevices, widened by protracted chemical action of air and water, are wholly or partly filled with dark brown residual clay or geest. The stream, on each side of the ridge, flows in a deep valley. The "Backbone" with its valleys on the east and west is a bit of Driftless area, and the sections north of the "Backbone," namely 3, 4, 5, 8, 9 and 10, as well as the region to the southeast between the centre of section 16 and Forestville, and southward along the river to section 34, constitute a region of loess Kansan topography.

Between the south end of the area just described and the southeast quarter of section 4 of Milo township, the Maquoketa flows through the Iowan drift plain, in a valley but little depressed below the general level of the country. In the northern part of Milo township, the river enters the second of the anomalous areas, and in doing so it turns away from a low drift plain to cleave its way through an area that rises from eighty to a hundred feet higher than that from which it turned aside. These

areas of anomolous topography afford illustrations of McGee's anomalous rivers. In section 5, where the stream crosses the north line of Milo township, the river channel is but a shallow trough in Iowan drift, and the drift plain, with little change of level, extends for many miles toward the south. In the east part of section 9 of the same township the stream flows in an old rock-walled valley of erosion approximately 200 feet in depth. The gradient of the stream is not perceptibly changed, the greater depth of the valley being due to the increase in altitude of the general surface in passing from the first to the second point mentioned.

With one or two unimportant exceptions, the Maquoketa flows in a comparatively deep canyon all the way from sections 9 of Milo township to the south line of Delaware county. At Hartwick, in section thirty of Delhi township, the valley is 190 feet in depth, and at Fleming's mill, a mile east of Hartwick, the depth is 215 feet. In Delhi township and in the northern part of Union the stream valley is cut through a plateau and not through a ridge, as is usual with other anomalous rivers. The pleateau has an extreme width of about ten miles, extending from section 23 of Milo township to section 21 of North Fork, and embracing in its eastern margin the valley of Plum creek. Loess hills all around its border rise sixty to eighty feet above the adjacent drift plain, and throughout its entire area of about sixty-five square miles the topography is erosial. Loess hills predominate, but there are some areas covered with sand, and in some places weathered crags of Niagara limestone control the character of the topographic forms.—Geological Survey, Annual Report, Vol. VIII, p. 132-134, 1907.

THE BACKBONE.

By E. M. Carr, Editor and Lawyer.

Scholarly geologists and noted writers have vied with each other in describing the charming bit of Iowa topography, located in Delaware County and widely known as the "Backbone."

This noted place has a higher altitude than other locality in eastern Iowa. During the glacial period the "Backbone" stood up like an island in the midst of an ocean of ice. Its surface and the surface of the adjacent valleys are free from any trace of Iowan drift.

The view from the highest part of the ridge down the Maquoketa valley for twenty-five or thirty miles has few equals anywhere. It is pleasing and inspiring to see how the gateways of the prairies open to let the river come out.

The tourist who visits Virginia is told that he should not return home until he has seen the Piedmont valley near Afton, a valley no more inviting or beautiful to behold than the Maquoketa valley when viewed from the culminating point of the "Backbone."

The "Backbone" ridge extends nearly north and south for a distance of about 200 rods. The river runs down on the west side, turns around the south end and flows back along the east side.

The narrowest point of the ridge is about midway between its ex-

tremes. There the summit is restricted to a few yards, and the cliffs on each side have a sheer descent of fifty or sixty feet.

The part of the ridge where the stone walls are most precipitous is not more than 100 feet in height, but upwards of another 100 feet are added by a gradual rise to the northern end. There the river turns away and its waters sparkle as they flow onward about two hundred feet below the summit.

From the crest of the ridge the ground decends abruptly on each side, and where the cliffs are perpendicular, or nearly so, they are carved by processes of erosion and secular decay "into picturesque columns, towers, castles, battlements and flying buttresses." (See Iowa Geological Survey Vol. 8, page 132.)

The charm of these gray stone cliffs could not be increased by an increase in their height. Their scale is sufficiently heroic, and their details sufficiently bold and rugged to readily difference them from all common place scenery.

The faces of the cliffs are half hidden by trees, clustering foliage and creeping vines that turn to flame with the first nipping frost of the autumn.

The ridge is crowned with trees. Tall tapering pines, some of the last of their species, there contending for existence with the more hardy elms, oaks and maples. The southern portion of the ridge is broad and comparatively level. This small plateau is covered with many varieties of trees, so clustered and arranged that it would be difficult for art to equal their restful charm.

The Maquoketa in the vicinity of the "Backbone" is a spring fed stream. It flows over clean washed sand and gravel and its depths afford good trout and black bass fishing.

But best of all are the pure waters which flow from the several springs at the "Backbone." An elderly gentleman in poor health, who resided near Independence was known to earnestly contend that many years had been added to his life by his camping annually in the valley on the west side of the "Backbone," and drinking the water from one of the springs in the vicinity. There may have been some foundation for the elderly gentleman's contention, for that valley is an exceptional place. The following is an extract from page 169, Vol. 8, Iowa Geological Survey:

"In a sort of terrace at the bottom of the valley on the west side of the 'Backbone' in section 16, weather-stained beds of the Buchanan stage occur under beds of sand and gravel of more recent origin, the contrast between the older and newer portions of the terrace being very striking. The valley here is older than the Buchanan stage, older than the Kansan."

It is, however, quite probable that the environment contributed more largely than the water to this invalid's improvement in health.

There are no marsh lands near the "Backbone." It is surrounded by primeval forests where the thousand voices of nature soothe the senses and help to restore overtaxed nerves. At night he was lulled to sleep by the whisperings of the pine trees, and in the morning he doubtless forgot his cares and infirmities while watching the long high ridge curve its dark green back in the rising sun.

Speaking of public parks in country as well as city, Prof. Thos. H. Macbride, at one time president of the Iowa State University, made the following reference to the "Backbone":

"The country people need the park just as much as the town folk and if they ask for it they will get it. There are plenty of bits of natural scenery and all that is needed is intelligent care and devotion to public use. Take for instance the Backbone in Delaware County, a long narrow ridge of limestone rock, ninety feet in height, washed on three sides by the clear waters and its crest crowned with a grove of native pines, beneath whose shadows rise perennial springs—what more can you wish?

"Chicago covets her bit of sand yonder; for the Backbone, Chicago would pay a million dollars, and would make it cost two millions more all for the pleasure of her people; and yet the good people of Delaware and Buchanan counties have not yet found out a way to preserve for themselves and their children this lovely natural park."

Doubtless there are writers who could better describe this Delaware county natural park than Samuel Calvin, but doubtless no one ever did. Here is an extract from a quite lengthy illustrated article that was written by him and published in the July, 1896 number of the Midland Monthly:

"The 'Backbone' is a fragment of unique topography that, like the Driftless Area, preserve the characteristics of the pre-glacial surface of the State. In fact, it is itself a driftless area, though rather small. The regions all around it are deeply covered with glacial deposits, but no drift is found upon the ridge or in the adjacent valleys. The integrity of the limestone towers and other erosive forms that would easily be toppled over are inconsistent with movements of glacier ice. The old ice sheet, for some reason, failed to spread its mantle of detritus over this region, and it is to this failure that citizens of the fertile midland are indebted for the preservation of the features on which depends its strange power of exciting in all intelligent visitors the sense of surprised delight. The beauty, the seclusion, the attractiveness of the place, are certain to be appreciated more and more as the years go by, provided short-sighted, unaesthetic avarice does not transform its forest land into pastures, or does not attempt to "improve" it for the sake of converting it into a profitable summer resort. If it can only be let alone, it will remain a source of purest pleasure, to be particularly enjoyed by the tired worker, who has learned that occasional outings, where one may have direct contact with woods and ricks as Narute left them, are the most effective means for relaxation from the mental strain consequent on the conditions under which work of every kind must now be performed. These weather-beaten cliffs, the difficult and lonely paths, the odorous pines in which the breezes make perpetual music, tend to refresh and reinvigorate both mind and body, provided only, one is in sympathy with Nature unimproved by art, modestly picturesque."

A NATURAL PARK SITE.

By Mrs. W. B. Small.

On different occasions during past years, I had heard Independence friends refer to excursions made to an interesting spot not far distant known as "The Devil's Backbone." From a meager description of the place, my mind had conjured up an immense, smooth, almost "unscalable" boulder which was curious but not beautiful. I had felt a curiosity concerning this "freak of nature," as I supposed it to be, and welcomed with delight the opportunity to visit the locality.

We found the place in question to be located four or five miles south of Strawberry Point, and not on a main traveled road; but the trail leads through fields and up rough hills, and finally on to a high peninsula which is encircled by the Maquoketa river. The open space on the summit of this point of land makes a beautiful picnicing ground, and the lover of nature rejoices to see that this retreat is unspoiled by the hand of man; it is too far from the city and too inaccessible to attract the pop-corn vender or the summer resort proprietor. While our lunch was in course of preparation, some one discovered the trail to a spring of water and he also reported marvelous examples of erosion to be seen in the descent of the rocky hillside. In our further explorations on both sides of the tableland, we found delightful surprises and there was a continuous succession of "ohs" and "ahs" from different members of the party. By the action of the water, great portions of rock have become detached from the main promontory, and these "detachments" have taken fascinating shapes, so that we found caves, rooms, and all sorts of enchanting nooks—topped by trees and edged with ferns and hairbells. The climax was reached in the eastern descent to the river; here, Nature has set aside a block of stone, and deftly chiseled a charming and complete room, where one can enter through the doorway and sit, as in a balcony, looking from the window upon the scene below. Tiny ferns and blossoms decorate the roof, and a delicate vine trails past a bird's nest on the ledge above the doorway. Perched upon the hillside, high above the river, it reminds one of a tiny Swiss chalet, which might fittingly be called "Sylvia's retreat." In our prairie state, it is a distinct surprise to find such rocky promontories of seventy-five or a hundred feet in height and it is devoutly to be hoped that this paradise of the geologist and botanist may be preserved as a playground for Iowa's people.—Iowa Conservation, Vol. II, No. 1, p. 11.

PROPOSED PARK AT BUCKINGHAM LAKE.

By Seth Dean.

I take it for granted that the head of every family is in favor of public parks as play grounds, but there may be honest difference of opinion about what is required to make a satisfactory park, but using my own judgment in selecting a suitable location the following considerations should be factors in influencing my action, viz.:

A tract well removed from the business centers, having a permanent lake or where a generous pond of fresh water can be deepened and en-

larged if necessary to furnish boating and fishing pastime, bordered on at least two sides by a level beach or shore tract of sufficient area for street and cottages and other necessary concessionaries.

Adjoining this level land should be a larger tract of hilly or rougher land that preferably should be partly forested and from the hilltops have a panoramic view of landscape stretching as a vista several miles, the more the better in different directions, and if natural springs or a permanent watercourse passes through or alongside this tract so much the better.

The tract must be in a healthy locality and must be conveniently accessible by rail, and by auto over the usual public highway system of the county. It should be so located that there is a sufficiently dense population that will be patrons to warrant the expenditure of a sum of money to purchase and put the tract in creditable shape in the first instance, and to provide sufficient revenue to maintain the park after it shall have been opened to the public.

In presenting for your consideration the advantages of the Buckingham Lake tract located in Mills but bordering on the line between Mills and Fremont counties, I am showing you a tract that possesses all the factors of desirability I have set out in the opening paragraph.

Consider first a lake bed of some 160 acres, originally part of the Missouri river but left a lake by a change in the river channel; this bed will require considerable dredging to create permanent depth of water sufficient to remain pure and healthy through the hot weather season and avoid freezing to the bottom in severe winters. Sufficient volume of flow from permanent springs will furnish water for the lake.

Bordering the lake on the north and east is flat land of sufficient area for cottages, boat and bath houses, and the usual concessions.

Bordering the lake on the north and east are the Missouri river bluffs, partly deforested, rising from the bottom land to heights of 150 to 300 feet, with some steep, almost perpendicular face slopes and others more gentle, affording light mountain climbing to visitors seeking exercise. From the top of these peaks fine views are obtained extending from five to twenty miles in different directions, of hills and valleys, woods and farm lands, several towns and the Missouri river flood plain ($2\frac{1}{2}$ to 6 miles wide with an occasional glimpse of the river water.)

The area available for park purposes in this vicinity is practically unlimited. I have had in mind a park covering about one thousand acres, but it could easily be increased to double or four times that area and at this time prevailing prices for land in this locality are not high.

NOTES ON BUCKINGHAM LAKE AREA.

By L. H. Pammel, Botanist.

In making a brief report on this region, let us consider the region from the following aspects:

1. Its value from a scientific point of view.
2. The historic aspects.
3. The needs of the region from the recreational standpoint.

The region under consideration is similar from Hamburg to Sioux City, the steep hills, narrow valleys rising from the wide flood plains of the Missouri with its alluvial deposits and here and there sand dunes and small ancient channels of the stream, all of these a peculiar part of the region. The width of the flood plain varies from a little over two miles near Buckingham lake to more than ten miles in some places in the great valley. For much of the region the bottoms are located on the Iowa side of the river. No similar expanse in the United States contains so large an area of flat and extremely fertile agricultural soil. It is the only part of the southwestern part of Iowa where the corn crop was good this year. These bottoms, originally, contained a large number of wild grasses like slough grass, tall blue stem, switch grass, etc. In the early days the whole region was a waving mass of wild grasses, as high as a horse, the paradise of the stockman. It was here where, in yet earlier days, previous to white settlements that the buffalo occurred in vast herds feeding on these nutritious grasses.

The region between Hamburg and Sioux City presents a series of bluffs which are unique in the topography of the country. They occur to the south in Missouri, gradually becoming less marked. They are also quite conspicuous in Nebraska, but in many cases less marked. There are only a few places in the world where this typical Missouri loess is so developed. Its value for agricultural purposes has long been recognized. The apples and grapes grown in the region are famous and these crops have given fame to the region. The typical deposit of the region is known as Missouri loess which geologists like Calvin, Shimek and others tell us is a wind borne soil, the fine material coming from the west. This region is a classic one in the study of the fauna found in the loess. Certainly from a scientific standpoint some of this area should be set aside for future generations. There is no better place to be found for a study of the fauna and of the soil than the Buckingham area in Fremont and Mills counties.

The plants of the tops of these loess bluffs are unique. They belong to the region west of the one hundredth meridian. Let me enumerate a few; the wiry drop seed grass, mesquite grass, Rocky mountain bee plant, small blue stem, snow on the mountain, stemless loco weed, the large blue flowered beard tongue, the Spanish bayonet or yucca, gum weed or grindelia, aplopappus, perennial ragweed, rush milkweed, milk vetch, two species of dalea, false mallow and the callirhoe.

From the standpoint of the geographical distribution of plants there is no region in Iowa that presents such a sharp contrast between plains and prairie plants as this region. Standing on the tops of these hills a person feels that he is in the region of North Platte or McCook, Nebraska. You are surrounded by the fauna and flora of that region. There are comparatively few areas in the region in which there is any considerable body of timber. The dry winds of the summer greatly influence the growth of trees. The west and southwest slopes of the hills are entirely devoid of timber, while the east and north slopes contain the following trees: Basswood, red oak and black oak, honey locust, slippery elm, hackberry, cottonwood, iron wood, American elm, red bud, coffee bean,

box elder and soft maple. There are also such shrubs as coral berry, snowberry, sumach, wild grape, poison ivy, Virginia creeper and staff tree.

One of the most interesting places in the region is Happy Hollow, west of Tabor, the small stream emptying into Buckingham lake. This is a narrow canyon with steep slopes covered with trees and herbaceous plants. It is an interesting place and is worthy of preservation. The lower parts of the hills facing the Missouri here have an outcrop of limestone, which became exposed when the Platte river forced the Missouri to skirt the bluffs on the Iowa side of the river. This limestone is rich in fossils. A considerable area, five or six miles, has this limestone rock exposed. There are few places along the Missouri river from Hamburg to the Big Sioux river where limestone is thus exposed. Nature has done here on a large scale what the human hand could not do. A number of interesting plants occur on these limestone rocks, like ferns, violets, spring beauty, etc. The lover of plants will always delight to roam over these rocky woods.

The Buckingham Lake is on the flat immediately adjacent to the hills. It once covered a much larger area but owing to the silt carried from the hills, has been filled up. With a little dredging work and diverting the channel, a nice little lake, covering between 40 and 50 acres, may be made and such a lake is urgently needed by the people of the region.

Not much can be said about the historic aspects of the region. Some things, however, may be noted. There are a series of fine Indian mounds on the crest of one of the hills and correspond to some mounds on another hill in Nebraska. There are numerous old Indian trails over the hills. There is also much evidence of old buffalo trails, which later were used by cattle. Mr. Harlan and Seth Dean will give this matter more in detail.

We must provide the region with some recreation places. I am told that the people of Glenwood, Hamburg and other points, if they want a little boating must go to Council Bluffs. These people are entitled to some consideration and we should provide, not only the unique hills and wooded canyons, but a lake where the family can spend a day in recreation. Southwestern Iowa is not provided with beautiful and scenic places, such as we have in northeastern Iowa or in the lake region. There are many places in the state that far surpass the Buckingham region in beauty, but none surpass it in scientific interest. The proposed state park in the region can be made really beautiful while nature has not given the native material, except the hills and canons. Man can so provide and improve it in places as to make it worth while. We must bear in mind that thousands of persons live in the region, who really do not have an opportunity of going elsewhere. We need some uplifting force for this community. The area to be included in this state park should be not less than 1,200 acres, which would include Buckingham lake, the wooded ravines, the loess bluffs and the limestone out crops.

THE LOESS AREA OF WESTERN IOWA.

By L. H. Pammel, Botanist.

The loess mounds though made of a tenacious clay show no springs or running water anywhere except in the wooded canyons at the base of the hills. The vegetation from early spring to fall is a succession of bloom, beginning with such plants as: pasque flower (*Anemone patens* var *Nuttalliana*) paint brush (*Castilleja sessiliflora*), puccoon (*Lithospermum angustifolium*) stemless loco (*Oxytropis Lambertii*) hairy puccoon (*Lithospermum canescens*).

Another common plant over the hillside is Bastard toad flax (*Comandra umbellata*). Three weeks later the most conspicuous plant over the loess mound is snowberry (*Symphoricarpos occidentalis*) which is most abundant near the timber line, encroaching upon the mounds. The snowberry is a forerunner of shrubs and trees at the edge of the loess mounds. Along with it, frequently in great abundance, is the hoary vervain (*Verbena stricta*) and the pomme de terre (*Psoralea argophylla*), the latter with long roots. The milk rush (*Lygodesmia juncea*) a typical xerophytic plant, is extremely common, occurring not only in the vertical clay banks but over the entire mound.

Near the tops of the mounds *Aplopappus* (*Aplopappus spinulosus*) forms broad masses. Quite widely distributed over these loess mounds we have the dalea (*Dalea laxiflora* and the *D. alopecuroides*), the former, with roots several feet long is particularly well adapted to xerophytic conditions, the small teretish leaves make it admirably fitted for the conditions existing upon the mounds. Along with it we find the prairie clover (*Petalostemon multiflorus*) both belonging to the typical plants of the plains of Nebraska and Colorado.

Of the early composite flowering plants upon the loess mounds the purple coneflower (*Echinacea angustifolia*) and black-eyed susan (*Rudbeckia hirta*) are more or less common over the entire loess mounds. The ox-eye (*Heliopsis scabra*) is common on the borders along with the snowberry (*Symphoricarpos*), New Jersey tea (*Ceanothus*) and vervain. (*Verbena*).

A partial list of the plants of the Loess Bluffs and their origin.

W=Western.

S=Southern.

E=Eastern.

Aplopappus (*Aplopappus spinulosus*) (W)

Milk rush (*Lygodesmia juncea*) (W)

Iron weed (*Vernonia Neveboracensis*) (S)

Boneset (*Eupatorium serotinum*) (S)

Orange boneset (*Kuhnia eupatorioides*) (E)

Blazing star (*Liatris punctata*) (W)

Gum weed (*Grindelia squarrosa*) (W)

Golden rod (*Solidago speciosa*) (E)

Golden rod (*Solidago rupestris*) (W)

Golden rod (*Solidago rigida*) (E)

Aster (*Aster oblongifolius*) (E)

Aster (*Aster sericeus*) (E)

Aster (*Aster multiflorus*) (E)

Everlasting (*Antennaria plantaginifolia*) (E)

Compass plant (*Silphium laciniatum*) (E & S)

- Marsh elder (*Iva xanthiifolia*) (W)
 Perennial ragweed (*Ambrosia psilostachya*) (W)
 Purple cone flower (*Echinacea angustifolia*) (E & S)
 Black-eyed Susan (*Rudbeckia hirta*) (W)
 Prairie cone flower (*Lepachys pinnata*) (W)
 Prairie sun flower (*Helianthus Maximiliani*) (W)
 Coreopsis (*Coreopsis palmata*)
 Fetid marigold (*Dysodia chrysanthemoides*) (W)
 Western thistle (*Cirsium canescens*) (W)
 Rocky Mountain bee plant (*Cleome integrifolia*) (W)
 Mallow (*Callirhoe involucrata*) (W)
 Flax (*Linum rigidum*) (W)
 Wild clover (*Trifolium stoloniferum*) (W)
 Dalea (*Dalea laxiflora*) (W)
 Missouri golden rod (*Solidago Missouriensis*) (W)
 Whorled milkweed (*Asclepias tuberosa*)
 Horse mint (*Monarda fistulosa*) (W & E)
 Pomm de Terre (*Psoralea argophylla*) (W)
 Silky Psoralea (*Psoralea argophylla*) (W)
 Hedge mustard (*Sisymbrium canescens*) (W & E)
 Field sorrel (*Oxalis corniculata*) (E)
 Prairie clover (*Petalostemon violaceum*) (W)
 Stemless Loco weed (*Oxytropis Lambertii*) (W)
 Partridge pea (*Cassia Chamaecrista*) (W & E)
 Snowberry (*Symphoricarpos occidentalis*) (W)
 Flea bane (*Erigeron stringosus*) (E & W)
 Sun flower (*Helianthus rigidus*) (W)
 Prairie dandelion (*Troximon cuspidatum*) (W)
 Wild four o'clock (*Oxybaphus hirsutus*) (W)
 Spurge (*Euphorbia maculata*)
 Spurge (*Euphorbia hexagona*)
 Spurge (*Euphorbia heterophylla*)
 Canadian blue grass (*Poa compressa*) (E)
 Prairie grass (*Panicum Wilcoxianum*) (W)
 Low blue joint (*Andropogon scoparius*) (W)
 Sand grass (*Calamovilfa longifolia*)
 Blue lettuce (*Lactuca pulchella*) (W)
 Lobelia (*Lobelia spicata*) (E)
 Whorled milk weed (*Asclepias verticillata*) (western form)
 Milk weed (*Acerates viridiflora*)
 Sweet William (*Phlox pilosa*) (E)
 Hairy puccoon (*Lithospermum canescens*) (E)
 Puccoon (*Lithospermum angustifolium*) (E)
 Beard tongue (*Pentstemon grandiflorus*) (E)
 Paint brush (*Castilleja sessiliflora*)
 Hoary vervain (*Verbena stricta*) (W)
 Mint (*Hedeoma hispida*) (W)
 Blue sage (*Salvia lanceolata*) (W)
 Skull cap (*Scutellaria parvula*) (W)
 Wild four o'clock (*Oxybaphus angustifolius*) (W)
 Slender door yard knot weed (*Polygonum ramosissimum*) (S)
 Snow on the mountain (*Euphorbia marginata*) (W)
 Flowering spurge (*Euphorbia corollata*) (E)
 Prairie willow (*Salix humilis*) (E)
 Spanish bayonet (*Yucca angustifolia*) (W)
 Camas plant (*Zygadenus elegans*) (W)
 Dropseed grass (*Sporobolus cuspidatus*) (W)
 Wild rye (*Elymus robustus*) (W)
 Larkspur (*Delphinium azureum*) (W)
 Western corydalis (*Corydalis aurea* var *occidentalis*) (W)
 Western wall flower (*Erysimum asperum*) (W)

Bird foot violet (*Viola pedata*) (W)
 Flax (*Linum sulcatum*) (W)
 New Jersey tea (*Ceanothus ovalus*) (W)
 Hosackia (*Hosackia Purshiana*) (W)
 Prairie clover (*Petalostemum multiflorus*) (W)
 Needle grass (*Stipa spartea*) (W)
 Lead plant (*Amorpha canescens*) (W)
 Wind flower (*Anemone cylindrica*) (W & E)
 Purple sorrel (*Oxalis violacea*) (E)
 Sumach (*Rhus glabra*) (E)
 Milk vetch (*Astragalus caryocarpus*) (W)
 Wild licorice (*Glycyrrhiza lepidota*) (W)
 Five finger (*Potentilla arguta*) (E & W)
 Houstonia (*Houstonia angustifolia*) (E)
 Common sunflower (*Helianthus annuus*) (W)
 Yarrow (*Achillea millefolium*)
 Morning glory (*Convolvulus sepium*), hairy form (W)
 Sheep sorrel (*Rumex acetosella*) (Cos)
 Spurge (*Euphorbia dictyosperma*)
 Spurge (*Euphorbia Geyeri*) (W)
 Blue grass (*Poa pratensis*) (Cos)
 Tickle grass (*Panicum capillare*) (E & W)
 Side oats (*Bouteloua racemosa*) (E & W)
 Switch grass (*Panicum virgatum*) (W)
 Dropseed grass (*Sporobolus cryptandrous*) (E & W)
 Missouri golden rod (*Solidago Missouriensis*)
 Yarrow (*Achillea millefolium*)
 Catchfly (*Silene antirrhina*)
 Wild four o'clock (*Oxybaphus angustifolius*)
 Small fox glove (*Gerardia aspera*)
 Prairie sunflower (*Helianthus Maximiliani*)
 Aster (*Aster multiflorus*)
 Sunflower (*Helianthus rigidus*)
 Blue sage (*Salvia lanceolata*)
 Narrow fox glove (*Gerardia tenuiflora*)

These are some of the common types over the entire loess mounds. The western blazing star (*Liatris punctata*) with its deep straight roots has enabled the plant to adapt itself to the droughty conditions which frequently prevail in the region. The Spanish bayonet (*Yucca angustifolia*) common in sections of Nebraska, the Dakotas and Kansas is a rare plant in this region, although becoming more common northward in the vicinity of Sioux City. It is confined to the steep banks, well up near the summits of the mounds.

The mesophytic flora is gradually encroaching upon the xerophytic, and as important forerunners for the mesophytic vegetation several of the shrubs like Snowberry (*Symphoricarpos*) play a conspicuous part. Eastward in northeastern and central Iowa the hazelnut (*Corylus Americana*) is the chief factor in changing the character of the vegetation.

The amount of precipitation collected for a series of years indicates that this region is much drier than in the drainage east of the Missouri river basin.

GEOLOGY OF MILLS COUNTY.

By John A. Udden, Geologist.

The uplands consist of an old drift plain, modified by erosion and by the deposition on its surface of a blanket of loess. But little is left of the old surface of the flat drift plain. The only remnants left are some flat strips of land on the highest divides farthest away from the largest streams. These strips are usually less than one-fourth of a mile in width, often much less. The widest flats seen were between the headwaters of Mill creek and Rock creek in Locust Grove township in Fremont county; in the vicinity of the town of Tabor; on the divide between Mud creek and Silver creek southeast of Silver City; on the divides north of Glenwood, north of Emerson and north and south of Hillsdale. The total area of these upland strips do not cover more than at most a few square miles of land in the two counties.

Excepting these flat areas the divides everywhere consist of ridges, more or less convex in cross sections. These are broadest farthest away from the principal drainage basins and as we approach the margins of the uplands they become more and more contracted and narrow. In the bluffs of the Missouri they are frequently only three or four feet across, with a steep slope on either side. The average elevation of these summits of the uplands for the two counties is about 1,170 feet above sea level, and it varies a hundred feet above and below this figure. The eastern two-thirds of the uplands in this area fall about thirty or fifty feet below the average, while the highest divides approaching the Missouri river bluffs rise above it in places as much as ninety feet. From north to south they have a general descent of about a foot and one-third to the mile.

By far the greater area of the uplands is formed of slopes which extend on either side from the creeks and ravines up to the crest of the ridges and flats on the divides. Farthest away from the larger drainage lines these slopes have a gentle grade and even near some of the larger creeks they may be a half mile in length and 100 or 125 feet in height. But near the Missouri bottoms they become more steep and frequently rise at a high angle to 150 or even 200 feet above the bottoms. Along these bluffs they are sometimes too steep to be tilled. Elsewhere they constitute the main farm land in the region. The distance from the foot of the lowest to the top of the highest slopes embraces a vertical range of about 360 feet.

There is no doubt that small patches of Cretaceous deposits lie under the drift in several places on the uplands, where they cannot now be seen. Sand and soft "sand-rock" have been found under the boulder clay a mile east of Emerson. Another well in the west bluffs of the Nishnabotna west of Henderson penetrated some gravel which may have been of the same age. On the eroded surface of the limestone in the quarry at Henton there are seen some disintegrated lumps of a brown sandstone which resembles the Cretaceous in appearance. It contains almost exclusively well rounded pebbles of quartz and chert. Blocks of the same conglomerate, always highly ferruginous, occur associated with small exposures of Coal Measure rocks two miles farther south and have been again noted on top of these older rocks east of Wabonsie lake in

section 23, Scott township, Fremont county. The clay which fills the caverns in the limestone south of Malvern is probably also of the same age, and the same may be said of a highly disintegrated, ferruginous and soft clayey rock resting on the eroded surface of the Coal Measure limestone southeast of the center of section 13, Tp. 67 N., R. XLII W.

While the age of the small outcrops enumerated above must be regarded as uncertain, the Dakota sandstone can be positively identified in two exposures in Mills county. One of these is in the low slope of the east bluffs of the Nishnabotna a little south of the center of the northeast quarter of section 22, two miles south of Henderson, and the other is half a mile distant, northeast of the southeast corner of section 14. Sandstone was quarried for many years at the former place, but the quarry is now partly filled. The face of the quarry appears to have been about ten feet high. The rock is a gray sandstone in heavy ledges, in places yellow or even brown. It breaks with equal readiness in all directions. Where the rock is hardest, the sand grains are held together by an opaque, white, thin layer of silicious cement which apparently is a product of interstitial leaching and redeposition. The solvent effect of underground waters are seen also in the absence of the ferruginous cementing material which is common in the Dakota sandstone elsewhere, and which makes the sandstone in section 14 almost black. In the quarry in section 22, the yellow or red oxides of iron color the rock in places where percolating water has not had free passage, as along shaly seams and in concretions. At the base of the quarries the sandstone rests on gray clay, or is interbedded with this, and on the faces of some ledges there are marks which show how the two kinds of sediments, while yet in a plastic state, have been worked into each other and broken into lumps which have slid into new positions, evidently under pressure of superincumbent sediments.

The sediments are of the littoral kind: mud, sand and gravel alternating. It is the first deposit of the advancing sea. The gravel is well worn, and consists largely of the most resistant material of the underlying Coal Measure rocks. No limestone fragments were seen, but in one block were some angular cavities which might have contained chips of such rock, afterward removed by solution. A study of several lots of pebbles of various sizes show that the larger ones are mostly made up of chert from the Coal Measures and this often contains silicified fragments of fossils. Most of the finer material is common quartz, and may be seen in the following table, which is based upon observations of several hundred pebbles and grains of the conglomerates and sandstones. Evidently the larger fragments are nearly all derived from the local rocks, the more resistant material of the Missourian.

The geographical condition under which the Missourian deposits were laid down are to be made out from the physical character of the beds themselves as well as from the plant and animal remains which they contain. These indicate off-shore conditions, such as prevail on a continental shelf, alternating with more shallow and less open waters. A considerable part of the shales contain fine, arenaceous material such as is common in the deposits out on a continental shelf. The limestones in-

dicate a still more open sea. The coal seams and the black clayey shales, on the other hand, were laid down in lagoons near the shore. Plant remains are rather scarce even in connection with the coal seams, which themselves have a small development. The presence of *Fusulina* of *Ammodiscus*, of other foraminifera and no less the abundance of echinoderms and especially crinoid remains, testifies to the presence of deeper waters at intervals. Below is given a classified list of the fossils noted.—Geology of Mills and Fremont Counties, Iowa Geological Survey, pp. 127-8, pp. 162-3 and pp. 159-0.

REPORT ON LOWER DES MOINES AREA.

By E. R. Harlan, Curator Historical Department.

I wish respectfully to advocate, for the southeastern portion of the state, the following:

The bed of the Des Moines River from its mouth to Raccoon Forks is the property of the United States Government or of the State of Iowa.

The lands adjacent to the Des Moines River are held under government designations, the owners generally not claiming though often using, the lands between the meander lines and the water in the river. All such lands should eventually be reclaimed or acquired where possible by the state, the entire length of the river, from the Minnesota to the Missouri boundaries.

For much of the distance between the region of Belfast, in Lee County and Eldon in Wapello County, there are maintained good highways on one or both banks of the river and upon or near the meander lines; wherever the roads are far from the river, it is because of the ruggedness of the country and banks.

The original forest growth of the bottoms and the hills along this section of the river has, in many places, been removed, but there is, throughout the greater part, a good variety and good specimens of all trees native to the region. Young growth, in many places, is replacing denuded parts, and replanting is practicable in all.

The acquisition by the state of the banks and adjacent grounds for study and recreation and their adaptation to that purpose, would be merely a matter of acquiring the slender strip of ground along or through which the river and the roads run, and then widening spaces which are not expensive but of highly interesting historic, scenic and scientific character. The least valuable in money of any lands in the region are best suited to the eventual reproduction of such plant growth and rights of way as will make of them most valuable places for recreation and study by the present and future generations.

Practically every prominent point of land abutting the river is topped by mounds of prehistoric origin, many of them as yet unvandalized. These are usually to be found where the natural ruggedness has prevented the building of roads. They are in the best places for resting, camping and sight seeing, are ample in number and so vary in position

and accessibility that, with the guidance of maps or charts, the student of Iowa's archaeological remains can be easily and inexpensively afforded the most valuable field work.

The rocks of the region present an interesting and valuable field for study and for scenic enjoyment, and are always within a few rods of the places for eventual road construction, and they are of the best quality for that use.

The water features are by nature limited to the stream itself and adjacent springs. By eventually damming the affluents of the river, artificial reservoirs for industrial or for pleasure purposes are easily possible.

The scenic and scientific character of the area then, though above but barely touched, would be sufficient to warrant the acquisition of the necessary lands to make of this stretch of the Des Moines River a public park.

But neither the scenic nor scientific qualities of this area are its sole consideration. If those were not respectable qualities, the historic character of that stretch of the lower Des Moines would, if understood, demand that the grounds should be rendered more easily accessible, and that the vanishing information concerning it should be fixed in texts on tablets and maps. Relatively it is as interesting as the Hudson and more romantic than the lower James.

This stretch of the Des Moines River crosses that part of the state known as "The Black Hawk Purchase." It is the strip of land approximately forty miles wide west of the Mississippi River which was wrested from the Indians after the Black Hawk War in 1832, and to the west of which they were required to remain for the security of the Illinois people. The strip was retained by the Government as part compensation for its expenses in that war. It was the first of Iowa lands opened for settlement. The part of the Black Hawk purchase in Lee County which would be cut off if the Missouri boundary ran across the Des Moines River and on to the Mississippi, is "The Half Breed Tract" where land titles remained in litigation until long after the Civil War. Hence settlers advanced up the Des Moines River to and above Farmington where they had no disturbance from faulty title, continuing on up the Des Moines River to a place below Eldon where the west line of the forty miles strip separated white and Indian, and Indian rights remained until they were extinguished on up to Ottumwa and west to the meridian of Knoxville.

The Des Moines River at that time was the principal prospect for transportation to and from that interior of what, even then was known would be the richest part of the proposed state. Awaiting the opening of the new country, this stretch of the Des Moines River became the most thickly populated and most prosperous of any region of equal area in Iowa. More "cities and towns" were "founded" here and are now gone than still remain. Upon the opening for settlement of the further western Iowa, the group of enterprising people which had rushed in between Belfast and Eldon hurried on, and in effect "expanded," leaving their name and character in the lower Des Moines valley, yet became factors, often features, in almost every city and state west that had beginnings between 1840 and 1858.

The lower Des Moines was like a pool of excellent stock which had trickled from the east on account of hard times in 1837 and other considerations, and from the south on account of slavery and poor prospects for better homes. This accumulation of good character in the lower Des Moines remained until the removal of the obstruction of Indian possessions, immediately to the west, in 1846. When that was released the population rushed as if by gravity to Ottumwa and west in Iowa. The region was scoured out by the emigration to California in the gold days of 1849 to 1856 and actually sprinkled the whole west with its representatives.

This is the key to the remarkable fact that more than seventy men and women, once of national reputation have lived in this region, and for the characterization by the late George G. Wright as "The Keosauqua Group of Famous Men," later corrected and expanded by the writer as the "Van Buren County Group of Famous Men."

Among the facts and names worthy to be observed in the history of the river ascending from Croton to Eldon, are the following:

CROTON—Site of one of the dams and locks of the navigation era. A hostile cannon ball fell here, the only one on Iowa soil and the one that reached farthest north of any in the Rebellion. It was fired in the Battle of Athens, Missouri.

SALUBRIA—Site of the Free Thought Colony founded by Abner Kneeland, of Boston, 1838; his residence is still in good preservation, though erected in 1840. Mr. Kneeland was the last man imprisoned in America for blasphemy, he having been among the first to question the divinity of Jesus Christ from a Boston pulpit. He mortgaged his library in 1839 for two hundred dollars (\$200.00), establishing the rank of his collection of books in this then sparsely settled region.

FARMINGTON—First County Seat of Van Buren County, point of assembling of Iowa Militia for battle against Missourians in the "Missouri Boundary War," 1836. John F. Dillon opened his office here as a physician but decided to become a lawyer. Numerous excellent buildings extant since 1840. Across the river is "Big Duck Marsh" and "Big Duck Creek."

PLYMOUTH—An extinct town adjacent to Farmington, once the site of a lock and dam for navigation and of a large flouring mill.

PALASTINE—South of the river; an extinct town extensively exploited in early days as a prospective city. No vestige of it remains.

"M'CRARY RESIDENCE"—South side. A conspicuous pre-war brick dwelling facing the river.

BONAPARTE—Site of a lock and dam in navigation system, and of the Meek Mills which supplied Iowa and the west with woolens and wool products from 1837 to 1870, and with saw-mill and grist-mill products much of that time. The dam was the subject of the famous "fish-way" case. Excellent old buildings. Charles E. Pickett was born here.

NAPOLEON—Extinct town across the river south of Bonaparte.

BENTONSPORT—Site of dam and lock. Once extensive mills, including paper mill which made the paper for the Gate City and other Iowa journals, 1856-1866. Once home of Captain Hancock and other early Iowa

legislators, and of Seth Richards and other noted merchants. Residence in youth of U. S. Senator W. E. Mason, U. S. Senator William A. Clark, Secretary of the Interior George W. McCrary, the author, Albert Bigelow Paine, Judge H. C. Caldwell and other notables. Excellent residences of different eras; some constructed by expert Mormon builders in 1846 who later achieved fame for Salt Lake City through their construction of the Tabernacle, its organ and of the Temple.

VERNON—Opposite Bentonsport; residence of Gideon S. Bailey who once chose the marshalship of the U. S. District Court rather than the Governorship of Iowa Territory.

LEXINGTON—Extinct town near the mouth of Rock Creek; a noted rallying point in earliest days for claim hunters and adventurers. The birthplace of Governor Ross of Texas.

ROCK CREEK—Flows into the Des Moines where the Des Moines returns from the Ox Bow to its general southeast course, forming a ridge from which was quarried stone first used in the present Capitol, but later condemned and removed.

COLUMBUS—Up the river from Rock Creek; a rival of Lexington and early home of Governor Stanard, of Missouri.

RAPIDS—In the river which Missouri claimed was the one intended in the Missouri constitution to describe its northern boundary.

DES MOINES CITY—Rival of Port Oro but combined therewith and renamed Keosauqua.

KEOSAUQUA—Famous from its foundation as a seat of progress and influence in Iowa and National affairs. Once the residence of more men of note than any other American town of its population. Earliest of existing court houses of Iowa, in continuous use from 1842 to present time. Residences of extraordinary interest for historical association. First bridge across the Des Moines River was erected here and that now in use being older than any other. A dam, lock, steamboat landing and power mill were erected here.

PLEASANT HILL—Now South Keosauqua; prosperous in old ferry days. The hill affords one of the famous scenic surprises along the lower Des Moines.

PITTSBURG—Originally Rising Sun, a famous ferry-crossing in California travel days. Noted milling and distillery town.

CHEQUEST CREEK—A beautiful stream. The Chequest stone quarries were near here and it was on this Iowa stone in the Washington monument that Enoch Eastman's words were carved—"Iowa, her affections like her rivers of her borders, flow to an inseparable UNION."

OLD CHURCH TREE—Above Chequest Creek, the great elm where the first assemblage west of the Des Moines, in what is now Iowa, was held for the worship of Almighty God.

FOX ISLAND—Noted fishing and hunting.

LICK CREEK—A most picturesque stream puts in here.

KILBOURNE—Once Philadelphia, early trading town and site of Indian camp. On opposite bank was a trading house of the American Fur Company. For a mile upstream and down stream, the bluffs are beautiful in every season of the year.

DOUDS-LEANDO—Hyphenated rival towns with the most interesting early history and traditions. Douds was formerly Alexandra, lies to the north; Leando formerly Portland, to the south.

SELMA—Took the trade from Iowaville, immediately above, when the railroad superseded the river and stage coach. Formerly Independent. Site of Saylor Cabin.

IOWAVILLE—Town upon site of famous Indian battle; stood against the west boundary of the Black Hawk Purchase. Extensive trade with the Indians. Only one of its houses remains.

BLACK HAWK—Founded and promoted by Andrew J. Davis, later the Butte, Montana, millionaire, lies south of Iowaville; site of the Davis distillery and of his residence, the latter still standing. A steamboat was built here in 1843.

IOWAVILLE-DITCH—Constructed from Avery Spring to Des Moines River across the Indian battle field. Hundreds of Indian bones were thrown up when the ditch was dug.

EVERY SPRING—Is a limitless water supply from the hillside, formerly beautifully environed.

THE INDIAN BONES—Have been noticed in the soil of the battle-field. Northeast of the place, on a rise toward the hills, are the burial grounds of the pioneer families of Jordans, Nelsons, Hinkles and their compeers. Also the grave of "Patriarch" Ashael, brother of Joseph Smith, founder of Mormonism. On the hill, almost immediately beyond the cemetery and crowning the hill are some half dozen conspicuous mounds of the earliest era of human life in this region.

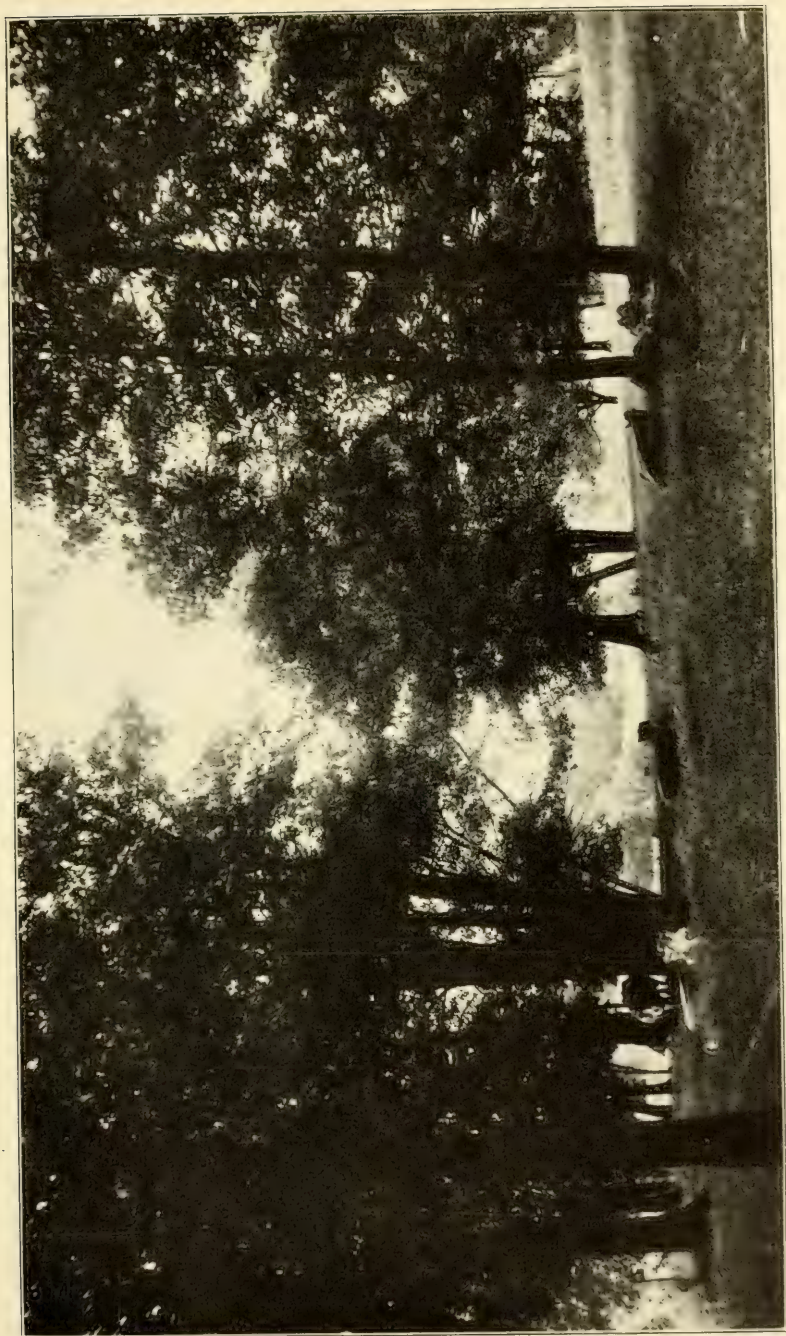
THE JORDAN HOMESTEAD—Near the grave site of Black Hawk and the Stump House, half a mile north of Selma, are notable houses.

THE MOUND—Where the Indian racers encountered defeat. It is the last point of interest before reaching Eldon. South of the river between Eldon and Selma is of superbly wild beauty.

ELDON—At the upper end of Indian bottom and end of present proposed section of proposed park.

Returning to Selma and looking up the river, the whole field of battle between the Iowa tribe and the Sacs and Foxes which took place in 1822, is to be seen. It was the ancient home of the Iowa tribe. The Sacs and Foxes came from their ancient home on Rock River, Illinois, crept to the hill-tops bounding the Iowa prairie on the north, waited for the Iowa men to go to the mound near Eldon, to race horses, then rushed between the latter and their camp of women and children. Black Hawk second in command, directed the assault on the camp of women and children, who, like the men, were nearly all exterminated. Black Hawk enjoyed good fortune until he was defeated by the U. S. soldiers in the Blackhawk War and at "Bad Axe" was thrown "forty miles west" of the Mississippi. He chose this site of his earlier triumph as his last home. Here he lived until 1838, died and was buried. His grave-site is in a cultivated field some distance from the river, but his body was stolen, the skeleton mounted by a phrenologist for exhibition purposes, but was later sur-

The novelty of this proposed park area, extending some fifty miles and the land features amounting to mere threads occasionally widened for



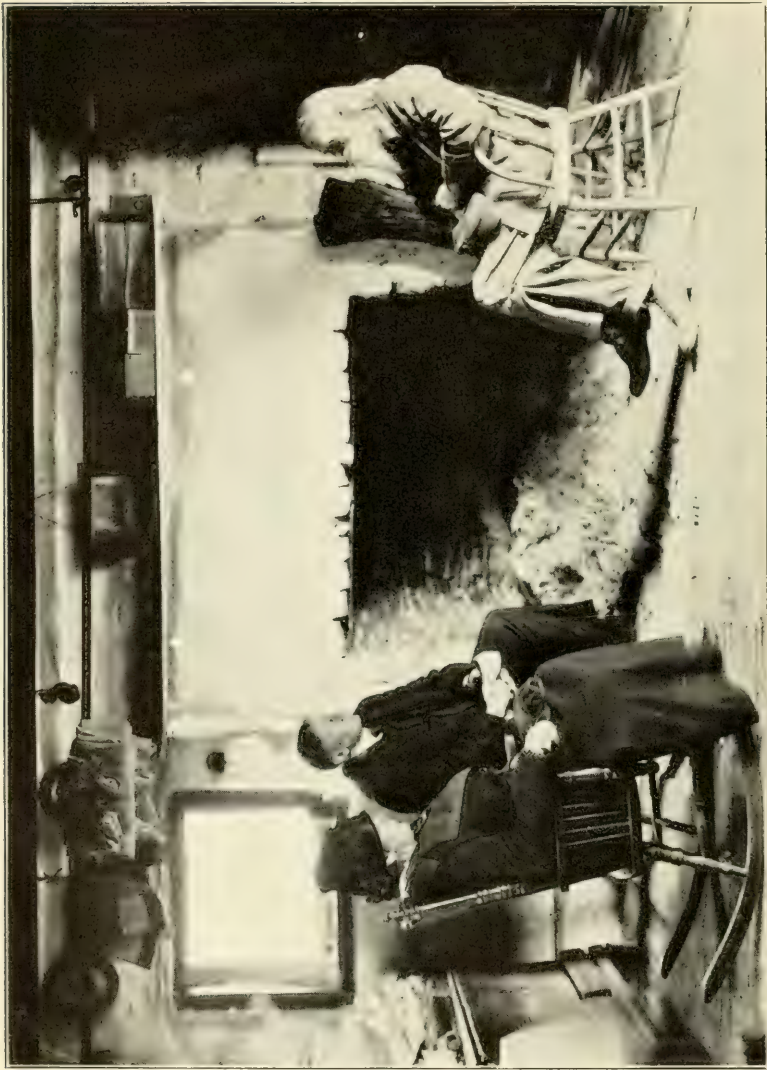
Waverly Park, on the Cedar River, Bremer County.



Iowa River Gorge, Iowa Falls.



Clear Lake Shore Line.



Interior of Ruckman Cabin, Marion County. Mrs. Frederick W. Weitz, Edgar R. Harlan and the Owner, Benton Ruckman. The Chest at Lower Left Made in South Carolina About 1780 for Mr. Ruckman's Grandfather, Brought By Him to Kentucky, Then by Mr. Ruckman's Parents to Iowa in 185— in Covered Wagon, the Ridge Pole of Which Is Suspended from the Ceiling of the Cabin.



Annual Soap Making Time at Cabin of Benton Ruckman, Marion County, the Home of Mr. Ruckman and His Parents Since Its "Warming" in 185—.



The Bluffs, Des Moines River, Mahaska County.



Waubonsie Trail Scene, Mills County.



Botrydium of the Woods, Webster County.



Limestone Towers, Catfish Creek, Dubuque County.

sufficient reasons, will at first strike the attention of the inexperienced or thoughtless as of less interest than if the same area of water were in the form of a circular lake and the land were its fringed frame. On second thought it will be seen that the very attenuated character of the park, with its parallel roadways already in use and well maintained, crossed every few miles by roads from remotest parts, affords a peculiarly ready and pleasant access to the longest drives by a larger number of men, women, and children than would be true if the same features were differently disposed. Instead of a center, there is an axis of interest leading to many and widely scattered population groups.

THE LOWER DES MOINES AREA.

By L. H. Pammel, Botanist.

As a member of this Board, I made an investigation in Lee, Wapello, Davis and Van Buren Counties for a proposed state park. The writer on previous occasions visited Van Buren County and adjacent counties in pursuit of the study of the native forest trees. A detailed study of these was made more than a year ago, and with Professor McDonald, a paper was prepared on the forest trees of the region. It occurred to me every time I visited the region that the region between Eldon and Belfast would offer a splendid site for a state park, not only for its scenic beauty, but for the many scientific features of the region. The exposed rock are of a particular interest to the geologist, the effect of the Kansas drift and subsequent erosions into sharp valleys present a splendid illustration of the type of topography in the Kansas drift area of Iowa. The region contains a large number of interesting trees, a blending of the trees of the north and the south. The following trees are abundant in the region:

White, black, shingle, bur, red, chestnut, black Jack, pin and post oak. No single area in Iowa has as many species of oak. There are also some magnificent specimens of sycamore, basswood, American elms, slippery-elm, hackberry, hard and soft maple, honey locust, coffee tree, red-bud, haws, wild crab, choke cherry, black cherry, cottonwood, butternut, red mulberry, black walnut, two kinds of shell bark hickory, and on the lower reaches of the Des Moines, some pecan, four ashes, the green, red, white and square stemmed ash. I am safe in saying also that no other region in the state has so many interesting shrubs. I may mention the paw-paw, trumpet creeper, three sumacks, several dogwoods, etc. Many southern herbaceous plants come into Iowa along the Des Moines. The list is a long one and need not be enumerated. I am also safe in saying that the number of species found here is larger over a given area than in any other section of the state. The largest sycamores and hackberries, in the state, occur in this region of Iowa. I saw a hackberry at least three and one-half feet in diameter on the Des Moines below Farmington. I think it was the largest hackberry that I have ever seen. It is surely worth while to keep some of the trees that run in age from one hundred and twenty-five to one hundred and seventy-five years, trees that were good sized when Pike made his memorable trip up the Mississippi.

At the present time, for much of the way between Eldon and Belfast, there is a highway on both the left and the right bank of the Des Moines River, excepting at such points where it would be difficult to construct a highway. There is a body of land varying all the way from fifty to three hundred feet running to the highway. The state should have a right to this land. I presume the United States Government has kept its right to this property, except as it was given to certain individuals to improve the area for mill and dam sites. Now it would seem that the state should acquire title to this land, if need be, by Congressional action. The proposed highway from Keokuk to Des Moines is nearly a reality and the state parkway would add greatly to its value as a highway. There would be added to this area also the width of the highway, making an additional sixty feet or more. The state would then own for park purposes, a considerable patch of land along the Des Moines. Additional land, 80 to 100 acres in extent, should be acquired by purchase at various points along the river, land which is not valuable for agricultural purposes but would be ideal for the state park, Mt. Zion, Douds-Leando, Kilbourne, Pittsburg, Keosauqua, Bentonsport, Bonaparte, Farmington, Croton, Hinsdale and Eldon. In addition, small wooded areas should also be purchased, a few acres in extent, near the outlets of small streams, situated between the cities. This would give opportunity for those using the highway to stop for recreation.

At Croton and other points there should be purchased parts of the deep canyon to preserve the native, rare plants. Below Croton, for instance, it would be well to purchase all of the crest of the hill as there are some historic Indian relics in this region. The whole area to be purchased, from Eldon to Belfast, would not exceed twelve hundred acres and would give southeastern Iowa a rare opportunity for recreation and park purposes, so far as the natural areas are concerned the scenic, scientific and historic features are unsurpassed in southeastern Iowa. It would seem to me that this area has a rare historic interest. Much of the early Iowa history was made in this section of the state. Perhaps no other part of Iowa has produced so many great men of the nation and state as this small region. We have here a rare opportunity of preserving for the future generations, the growth of building operations in the state, from the log cabins, of which a few still remain, to the Virginia spacious house and its fire-place to the architecture of the Civil War period and the growth since that time. A few of the old mills and stores might be added to the list. It appears to me that some of these places might be obtained by the state and included in the state park. I feel sure that these buildings can be obtained at a very low figure and, in some cases would be given to the state.

Mr. Harlan has so forcefully expressed the value of this area from the historic standpoint, that his report should be made an important part of our recommendations to the Executive Council. I concur most heartily with his recommendations.

The Farmington area and lake investigated is on the west side of the Des Moines. In order to reach it one must cross the Des Moines river at Farmington, going down the Des Moines and crossing Indian Creek

and then going over a hill and for a quarter of a mile beyond. However, I might, in this connection, say that another road leading from Farmington goes over a narrow hogback partly covered with timber where there has been considerable erosion. The hogback contains an abundance of white oak, shellbark hickory and on the slope some basswood, ash, etc.

The 100 acres to be included in this park area contain a lake of about 30 or 40 acres. It is a comparatively wide valley probably formed by an ancient stream now diverted, that emptied into the Des Moines a quarter of a mile below the dam on the lake. The depth of this water in the lake is nowhere much more than four feet and at the present time has only a few open places. The rest is filled with lotus or chinquapin, a most beautiful sight. Thousands of the flowers were in bloom, the large creamy white flowers making a wonderful sight. Probably nowhere in Iowa can one behold so large a field of this lotus. It is probably also one of the few places where it occurs along the Des Moines as far north, west of the Mississippi river. It occurs in the sloughs of the Mississippi as far north as Wisconsin and Minnesota. The species may have been planted here by the Indians who used the tubers for food. There were a few cattails and arrowhead. I noted the following plants on the border of the lake: *Scirpus*, *Aster* sp, *Solidago* sp. The adjacent land rises rather abruptly and is of the Memphis silt loam type of soil. There is also occasionally an outcrop of sandstone. The adjacent region is largely covered with a second growth of timber. The trees are mostly second growth, although a few of the original trees are still standing, especially the white oak. We note here also that the black walnut and honey locust grow on the upland. Species were noted of all the oaks native to Iowa except two, namely, the pin oak (*Quercus palustris*) and barren oak (*Q. ellipsoidalis*), the red oak (*Q. rubra*), quercitron oak (*Q. velutina*), white oak (*Q. alba*), swamp white oak (*Q. plantanoides*), chestnut oak (*Q. acuminata*), bur oak (*Q. macrocarpa*), two hickories shell bark (*Q. ovata*) and pignut (*G. cordiformis*), black walnut (*Juglans nigra*), butternut (*J. cinerea*), white ash (*Fraxinus americana*), green ash (*F. lanceolata*) are common. In the bottom near the Des Moines the black maple (*Acer nigrum*), soft maple (*A. saccharinum*), box elder (*A. negundo*), cottonwood (*Populus deltoides*), hackberry (*Celtis occidentalis*), white or American elm (*Ulmus americana*), slippery elm (*U. fulva*), honey locust (*Gleditsia triacanthos*), black locust (*Robinia Pseudo-Acacia*) introduced, the sycamore (*Platanus occidentalis*), basswood (*Tilia americana*), the river birch (*Betula nigra*), on the Des Moines sand bar willow (*Salix fluviatile* and *S. nigra* and *S. amygdaloides*), an abundance of red bud (*Cercis canadensis*), hackberry (*Celtis occidentalis*) and mulberry (*Morus rubra*), hophorn beam, choke cherry (*Prunus virginiana*), black cherry (*P. serotina*). Of the shrubs the following were noted: Buck bush (*Symphoricarpos orbiculatus*), dew berry (*Rhus nigrobaccus*), some rose, probably (*Rosa blanda*), sweet briar rose (*Rosa rubiginosa*), grape (*Vitis vulpina*), dogwood (*Cornus asperifolia*), hazel brush (*Corylus americana*). I did not note many herbaceous plants in bloom. *Ruellia ciliosa*, *Monarda fistulosa*, *Potentilla canadensis*, *Anemone virginiana*, *Polygon-*

atum commutatum, *Festuca nutans*, *Bromus purgans*, *Thalictrum purpurascens*, blue grass (*Poa pratensis*).

In a paper on the Keosauqua area for southeastern Iowa I touched on the more important scientific features of the region in general. In a former visit long before the matter of state park sites for this area was taken up I felt that some of this interesting region should be set aside for park purposes. The region is an interesting one. This part of Van Buren county, like the remainder, was covered with the Kansan drift.

W. H. Stevenson, P. E. Brown and G. E. Corson and W. H. Reid state that "It extends to a depth of 50 to 100 feet and is somewhat thicker in the southwestern than in the northeastern part of the county. It consists of two well marked divisions of boulder clays, a lower blue clay and an overlying yellow clay, both of which include more or less sand and gravel. There is no well defined boundary between these two clays, but they grade gradually into each other. The lower clay is dark blue, compact and hard and filled with pebbles and small boulders. It varies in thickness from a few feet up to 75 feet. The overlying clay is usually a buff to reddish-yellow in color and it frequently contains sandy areas. It contains more life than the underlying material. Usually the yellow clays vary from 25 to 50 feet in thickness.

"At some previous geological time, a layer of fine dust-like, ash-colored material, called loess, was deposited over the glacial drift. Much of this material has been washed away since its deposition, especially along the Des Moines river, and the remainder forms a thin covering over the upland areas. This loess covering is usually 2 or 3 feet and never more than 10 feet in depth.

"Along the rivers in the county there are terrace soils, or former bottom lands which have been raised above the overflow of the streams by the shrinkage in volume of water or by the deepening of the channel of the stream. There are also several bottom land soils, occurring adjacent to the streams and subject to overflow.

"The soil of the area under consideration is a terrace soil known as the Calhoun silt loam. On a part of the area there are outcrops of a limy sandstone on which ferns abound. Most of the area is embraced in the Calhoun silt loam.

"The surface soil to a depth of 10 to 12 inches is composed of brown or grayish brown, compact, but fairly friable silt loam which when dry often appears almost white. In some areas the surface soil is somewhat darker than the typical. Beneath the surface there is a layer 3 to 4 inches thick of whitish or grayish white mealy silt loam, which changes below into a gray clay loam mottled with brown. The material from 20 to 24 inches usually becomes a drab or bluish gray, plastic silty clay mottled with yellow and brown. Below 30 inches the color becomes lighter with mottlings of yellow and gray.

"In topography this soil is level or undulating to slightly sloping. The slope from the terrace to the bottoms is gradual, extending for as much as one-eighth of a mile in length and this slope is often cut by ravines. Small streams frequently cut up the larger areas. The elevation above

the bottoms is usually 50 or 60 feet, but in the smaller areas the difference is often only 20 or 30 feet. In most of the type the drainage is good, but on the flat areas it is apt to be deficient."

The usual trees common in the county were observed by the writer—sycamore, basswood, slippery elm and American elm, hard maple (*Acer nigrum*), bur oak, white, chestnut, quercitron, red, black and post oak, red bud, honey locust, coffee bean, black locust (naturalized), hop-horn beam (*Ostrya virginiana*), white ash, green ash, almond leaved willow, black willow, sand bur willow, cottonwood, river birch, hazel, prickly ash, dogwood (two kinds), hop tree, sumach, poison ivy, fragrant sumach (*Rhus canadensis*) and wild grape. There are also many interesting herbaceous plants, aster, golden rods, violets, lilies, crowfoot, etc. There is a splendid covering of second growth timber, but only a few of the primeval trees are left. It seems to me this land next to the Mississippi river has such a strong tendency to wash that it cannot be well suited for agricultural purposes and sooner or later must be covered with trees to hold the flood waters back.

The region will make a splendid game preserve and should be acquired. Inasmuch as the people of Keosauqua propose to give the state a quarter section, we should acquire the area in question, some 800 to 900 acres more so that the area may be rounded out. If we do not acquire it this year, I am in favor of acquiring the tract with virgin timber containing some large trees, red, bur and white oak. There are some 60 acres in this old timber tract.

GEOLOGY OF VAN BUREN COUNTY.

By Charles H. Gordon, Geologist.

The present channel of the Des Moines river evidently dates from the glacial epoch. Where the river encounters the limestones of the Mississippian or Lower Carboniferous series, the channel is comparatively narrow with more or less precipitous rock escarpments.

West of Kilbourne, the soft coal measure rocks descend, passing below the river level below the west line of the county. Here the valley is wider and the slopes more gentle. In the vicinity of Farmington, also, a similar condition prevails, though here in part attributable to depressions in the surface of the limestones. This valley therefore well illustrates the principal "that mature and old forms are more rapidly developed on soft than on hard rocks." As a whole the valley shows the topographical characteristics of youth.

At the middle of the county, the river forms a loop not unlike an ox-bow in shape. Between the upper points of the loop, the surface is very nearly on a level with the general plain to the northeast, of which plain it forms a part (758 feet above sea level). Along the line of the railroad this has been reduced slightly by the erosion of the branches. It is evident that the Des Moines river flowed over this point, but was deflected southward somewhat at the very beginning. This course was probably determined by a slight depression below the general plain level.

possibly due to irregularities in the rock surface or to glacial drainage. As erosion went on, its efforts were directed toward straightening its course by the corrosion of its left bank at the Kilbourne bend. The effect of this, however, was to cause still greater deflection southward which was increased when the hard limestones were encountered. As the loop gradually extended itself southward, the stream encountered similar resisting rock walls, but of somewhat softer constitution, so that corrosion took place here more rapidly than before. For a time the corrosion was fairly uniform, giving the loop a regular outline. After reaching the ninety-foot terrace level, however, the soft Keosauqua sandstone had been penetrated toward the east. By the descent of the strata to the southwest this sandstone remained about at the river level, so that while corrosion was taking place quite rapidly in the soft sandstone toward the southwest the hard limestone eastward offered a much more effectual resistance, giving rise to the northward bend below Keosauqua, instead of a uniform curve which would result if the rocks were of uniform hardness.

Terraces.—The highest terrace is about 140 feet above low water at Keosauqua. From this point the terraces descend quite uniformly. The most marked are the following.:

145 feet	120 feet	90 feet
75 feet	50 feet	25 feet
15 feet	and	10 feet

—History of the Des Moines, Vol. IV, p. 235.

The Des Moines River.—The Des Moines river flows nearly due southeast, and with one exception varies little from a direct course. This exception occurs in the center of the county where the river is abruptly deflected from its course to the southwestward, but soon returns, forming a deep U-shaped loop whose axis is a right angle to the general course of the stream. The length of the loop thus formed is about five miles, while across the neck the distance is not more than two miles. To make this short distance the river takes a roundabout course of fully twelve miles. The principal tributaries to the Des Moines are Indian, Bear, Chequest and Holcomb creeks on the south, and Reed, Coates and Lick creeks on the north.

Indian Creek.—This creek bisects the Des Moines between the Des Moines and Fox rivers, flowing parallel with them from its source near the western line of the county to Willett station where it turns eastward. Except in the last four miles of its course, where it invades the Saint Louis limestone, the stream flows over a thick bed of drift. In this portion the stream has comparatively wide bottoms with more or less abrupt but rounded slopes.

Bear Creek.—Bear creek has a comparatively steep declivity. It takes its rise on the plateau level south of Keosauqua and, soon penetrating to the rock, is bordered in the lower half of its course by more or less prominent mural escarpments. It opens into the Des Moines at a high angle just south of Bentonsport.

Chequest Creek.—Chequest creek rises in Davis county and flows approximately parallel to the general course of the Des Moines, into

which it empties at Pittsburg. Throughout the greater part of its course in Van Buren county, the stream flows over the limestone of the Saint Louis, in which it has cut a somewhat irregular channel with prominent rock escarpments.

Lick Creek.—Lick creek takes its rise in Jefferson county, flows south-easterward and enters the Des Moines at Kilbourne. Throughout most of its course the channel is confined to the drift and coal measure formations, the latter of which, from lack of resisting materials, offers few exposures, and the region is marked by rounded, hilly topography. Lick creek penetrates to the limestone, however, a short distance above Kilbourne, and from this point its course is marked by abrupt deflections and prominent rock escarpments.

Coates Creek.—Somewhat similar in character to Lick is Coates or Honey creek. Taking its rise in the upland plateau in numerous widely branching secondaries and flowing southward, it discharges into the Des Moines. It soon penetrates the drift and coal measure deposits, and its course thereafter is marked by more or less prominent rock acclivities carved in the Saint Louis limestone.

Reed creek is almost the counterpart of Coates, except that in its lower course it is more sinuous from deflections due to the peculiarities of the underlying rock structure.—Iowa Geological Survey, Vol. IV, p. 203, 204, 205.

FOREST TREES OF MUSCATINE COUNTY.

By Ferdinand Reppert.

The timber area of Muscatine county is confined to the region along the Mississippi and Cedar rivers. Originally these forest belts were in the main unbroken and continuous along these watercourses, and from four to six miles or more wide. Much of this area has been cleared of its timber and converted into farm and pasture lands. The original larger forest trees have almost disappeared, so that what is now seen are mostly "second growth" trees. There is very little, if any, timber cut for export or manufacturing purposes. There are frequent groves on the prairie farms, planted to protect the houses and live stock from wintry blasts. The soft maple is the principal tree planted for this purpose; small groves of black walnut and evergreen trees are occasionally seen. The forest trees which most largely contribute to the timber supply are the white oak, bur oak, shellbark hickory and mocker-nut hickory. A few other species contribute more or less to the wood supply, but the six species above mentioned largely predominate.—Geological Survey, Vol. IX, pp. 380-1.

GEOLOGY OF MUSCATINE COUNTY.

By John A. Udden, Geologist.

The west bluff of Pine creek, all the way from Pine creek to near the junction of its two main branches near the center of section 17 in Montpelier township, consists of a high and frequently vertical escarpment

of solid sandstone, from fifty to a hundred feet high. This sandstone rests on softer shaly beds, into which the creek has cut its valley. The sandstone has been partly undermined by the stream, furthermore it is cut by vertical joints; and for these causes blocks of the rock break off and fall down, forming a talus below. Near the north end of the escarpment some large blocks of the whole formation of the sandstone have begun to creep out and down on the underlying shale and have left a deep fissure ten feet wide between the detached and face of the main ledge. This fissure is known as Devil's Lane. A remnant of another block lies still farther out, having advanced farther down toward the creek. This must have been detached first from the parent ledge. A third block is just in the process of being detached and is ready to join the procession in the rear. On the surface of the ground above, there are three sunken pits in a row of the forming crevice. This is open below at the south end, and is known as the Niche. North of the lane there is a recess in the wall which has been called the Bake Oven. Some distance to the north of this, close up to the brink of the wall, another small recess in the sandstone has been formed. This received the name of the Wild Cat Den from the nimrods among the early settlers in that region. The beautiful scenery along this mural escarpment is enhanced by some native pines that rise in somber grandeur from the brink of the wall. During the warm season it attracts from the cities and from the surrounding country, many visitors, who find comfort in the cool shade of the bluff and enjoy refreshing drinks from the Chalybeate springs that issue from under the base of the sandstone. Some years ago a cast of the curving, tapering radical end of a calamites tree was found in one of the blocks of the talus below this cliff.

Northward from the river the Des Moines rapidly thins out. Near the east line of the county it is last seen in the south half of section 1, in Montpelier township. Along the east branch of Pine creek it disappears in the northern portions of sections 3 and 4. Near the center of the south line of the latter section there are about thirty feet of sandstone, mostly disintegrated to an incoherent sand, with here and there some hard, thin, ferruginous layers.—Geological Survey, Vol. IX, pp. 310-11.

REPORT ON WILD CAT DEN.

By L. H. Pammel, Botanist.

The Wild Cat Den in Muscatine county is situated on Pine creek, some two and one-half miles from the U. S. Biological Station at Fairport, ten miles from Muscatine and fifteen miles from Davenport, also about seven miles from Pleasant Prairie Station on the Clinton, Davenport and Muscatine Railroad. It is easily accessible to about 150,000 people. It is within half a mile of the New Era Community Center, which is maintained in part by Miss Clara L. and Miss Emma C. Brandt.

Wild Cat Den or Wild Cat Glen is well known to the people of the region and its fame as a region containing rare and interesting plants

is known far beyond the border of Iowa. Dr. H. C. Cowles of the University of Chicago annually takes his classes in ecology to the region to study the ecology of the region. Dr. B. Shimek, Professor of Botany of the University of Iowa, also uses the region to study the plants. The region has much of historical interest connected with it. Montpelier is on the Mississippi not far from the mouth of Pine creek. The first store in the county was established in 1838 by a Mr. Nye, who landed at the mouth of Pine creek in 1834. He was the second settler in the county. His grave and the grave of some others of the pioneers are neglected. The grist mill is also an old landmark, and was built soon after the permanent settlement in that vicinity was established. It is in a good state of preservation and is still in use, the dam as well as the mill. It is a most picturesque place and good enough for any artist to paint as a rural scene.

Wild Cat Den occupies an area of about 200 acres, belonging to the two Brandt sisters, Mr. Otto Fitchner and Mr. Welsch. These people are to be highly commended for keeping the place in such fine condition. The wild plants have had an opportunity here to grow and the wild life has also been protected. In many of the scenic places I have visited in Iowa much destruction has occurred, over pasturing, cutting of timber, which has destroyed the beauty of the natural surroundings. However, in the case of Wild Cat Den in Muscatine county, the owners have protected the area in such a way that the original conditions still exist. It is to be noted, however, that people have gone in during the past to remove the young white pine. It is interesting to note that there are no medium aged white pine left. The original trees 120 to 150 years old and very young trees six to seven years only remain. The early settlers removed the trees six to ten years old to plant in their yards. The removal of young pines and other plants was so frequent that the Brandts do not allow anyone on the place, except by permit. There is evidence that young pine, if given a chance, will recover the ground. Many of the old oaks and other trees are still standing in the virgin condition.

AGE OF TREES.

Species of trees.	Age.	Diameter.
White pine	120 years	25 inches
White pine	130 "	20 "
Red oak	95 "	25 "
White ash	85 "	20 "
Black oak (<i>Quercus ellipsoidalis</i>).....	120 "	20 "

Geology of the Region.—Muscatine county is generally a smooth plain except for the narrow valley which has dissected the plain. In the eastern part of the county the elevation reaches a maximum of 800 feet. The Cedar river flows across the western part of the county and has formed a broad valley. The Mississippi river flows along the eastern border and below the city of Muscatine forms a semi-circular valley, known as Muscatine Island. The streams, except those mentioned above, are short. Pine creek is of this type. This stream heads in Fulton and Wilton townships, flowing through Sweetland and Montpelier townships, emptying into the Mississippi between the towns of Montpelier and Fairport. The area is located in Montpelier township near the New Era community center. The rock outcrops consist of carboniferous sandstone and associated shale. The soil is known as Lindley silt loam. H.

W. Hawker and W. H. Johnson in a U. S. Dept. of Agr. 1916 Report, "Soil Survey of Muscatine County, Iowa," state:

"The main occurrence of the Lindley silt loam is on the bluff slopes extending from the upland to the alluvial bottoms, and back along the deeply eroded stream channels draining the uplands. By far the greater part of the total area mapped occurs in the eroded area east of Muscatine. The type is forested, the growth being the same as that of the Memphis silt loam, with which this soil is associated.

"Forestry and pasture are the only uses to which the type can be devoted. West of Muscatine some groves of walnut are found on the bluff slope; these are valuable chiefly for cabinet and furniture wood. The area of the type under cultivation is so small that no data on crop yields could be obtained. Cultivated crops suffer from excessive drainage, drought, and the disastrous erosion to which the sharp slopes of the type are subject."

Trees of the Region.—The following trees were observed: White pine (*Pinus strobus*) on the sandstone slopes, white oak (*Quercus alba*), red oak (*Q. rubra*), bur oak (*Q. macrocarpa*), barren oak or black oak (*Q. ellipsoidalis*), chestnut oak (*Q. acuminata*), swamp white oak (*Q. platanoidea*), white ash (*Fraxinus americana*), green ash (*F. pennsylvanica* var *lanceolata*) in low grounds, shagbark hickory (*Carya ovata*), mockernut or white heart hickory (*Carya alba*), pignut or bitternut (*Carya cordiformis*), black cherry (*Prunus serotina*), choke cherry (*P. virginiana*), ironwood (*Ostrya virginiana*), blue beech (*Carpinus caroliniana*), river or black birch (*Betula nigra*) in low grounds, sycamore (*Platanus occidentalis*), basswood (*Tilia americana*), wild crab (*Pyrus lowensis*), American plum (*Prunus americana*), service berry (*Amelanchier canadensis*), red haw (*Crataegus mollis*), C. *Margaretta*, C. *punctata*, box elder (*Acer negundo*), soft maple (*A. saccharinum*), black sugar maple (*A. nigrum*), sugar maple (*A. saccharum*), quaking aspen (*Populus tremuloides*), large toothed aspen (*P. grandidentata*), cottonwood (*Populus deltoides*), black willow (*Salix nigra*), almond leaved willow (*S. amygdaloides*), cordate willow (*Salix cordata*), honey locust (*Gleditsia triacanthos*), coffee bean (*Gymnocladus dioica*), slippery elm (*Ulmus fulva*), white elm (*U. americana*), hackberry (*Celtis occidentalis*), red-bud (*Cercis canadensis*).

The shrubs observed by the writer in the region are as follows: Prickly ash (*Xanthoxylum americanum*), dogwood (*Cornus asperifolia*, *C. circinata*, *C. amomum*, *C. alternifolia*), hazel (*Corylus americana*), prairie willow (*Salix humilis*), rose (*Rosa blanda*), lead plant (*Amorpha canescens*), wild indigo (*Amorpha fruticosa*), New Jersey tea (*Ceanothus americanus*), sumach (*Rhus glabra*), black cap raspberry (*Rubus occidentalis*), red raspberry (*R. idaeus* var *aculeatissimus*), black berry (*R. cuneifolius*, *R. villosus*), honeysuckles (*Lonicera glauca*), bush honeysuckle (*Dievilla trifida*), black haw (*Viburnum Lentago*), haw (*V. pubescens*), huckleberry (*Glyssacia baccata*), wild grape (*Vitis vulpina*, *V. labruscae*), Virginia creeper (*Psedera quinquefolia*), gooseberry (*Ribes gracile*, *R. cynosbati*).

Herbaceous Plants.—A few of the herbaceous plants noted by the writer are as follows: Anemone (*Anemone nemorosa*), wood sorrel

(*Oxalis violacea*), Lousewort (*Pedicularis canadensis*), trillium (*Trillium sessile*, *T. grandiflorum*), false Solomon's seal (*Smilacina stellata*, *S. racemosa*), Solomon's seal (*Polygonatum commutatum*), bellwort (*Uvularia grandiflora*), dog toothed violet (*Erythronium albidum*), violets (*Viola cucullata*, *V. pubescens*, *V. striata*, *V. pedata*, *V. pedatifida*), yellow grass (*Hypoxis oreata*), blue eyed grass (*Sisyrinchium angustifolia*), golden rods (*Solidago latifolia*, *S. ulmifolia*), asters (*Aster sagittifolius*, *A. Drummodii*, *A. laevis*), Bishop's cap (*Mitella diphylla*), vetch (*Vicia americana*), milk vetch (*Astragalus canadensis*), meadow grass (*Poa debilis*), Tick trefoil (*Desmodium Dillenii*), hog pea (*Amphicarpea Pitcheri*), blue grass (*Poa pratensis*, *P. compressa*), ginseng (*Panax quinquefolium*), wild sarsaparilla (*Aralia nudicaulis*), Saint Jacob's ladder (*Polemonium reptans*), Sweet William (*Phlox divaricata*, *Phlox pilosa*), water leaf (*Hydrophyllum virginicum*), prairie clovers (*Lespedeza violacea* and *L. reticulata*) occur in drier soil. Chickweed (*Cerastium nutans*), sandwort (*Arenaria latifolia*), rattlesnake plantain (*Goodyera pubescens*), strawberry (*Fragaria vesca*), morning glory (*Convolvulus spithameus*), agrimony (*Agrimonia parviflora*), goat's beard (*Spirea aruncus*), aster (*Aster cordifolius*, *A. macrophyllus*), turtle head (*Che-lone glabra*), false fox glove (*Gerardia tenuifolia* var *aspera*), small false Solomon's seal (*Maianthemum canadense*), wild hyacinth (*Camassia fraseri*) are other species of the region.

Of the rarer plants occurring in this vicinity, but not on these sandstone bluffs, mention may be made of *Rhexia virginica*, *Phlox bifida* along the Cedar river; *Symplocarpus foetidus*, *Allium tricoccum*, *Calopogon pulchellus* in boggy places in the Cedar river region; *Dodecatheon meadia* is rather common on prairies; *Angelica atropurpurea* and cowbane (*Cicuta bulbifera*) in low grounds. *Pentstemon grandiflorus*, *Breweria pickeringii*, *Cristatella jamesii*, *Helianthus petiolaris* and *Panicum autumnale* is more or less common on Muscatine Island.

Above the alluvial drift to the edge of the timbered area at Wyoming Hill, tall red top (*Triodia cuprea*) grows in large masses. The dry lands are covered with this beautiful grass. It has spread for some miles north and south along the railroad. *Liatris culindracea*, *Andropogon furcatus* and *Koeleria cristata* are found, but less commonly. The wooded area is marked by the abundance of prairie clover (*Lespedeza procumbens*), bottle grass (*Asprella hystrix*), red oak (*Quercus rubra*) and hickory (*Carya alba*).

Carboniferous Sandstone Vegetation.—The region here considered is locally known as "Wild Cat Den," and occurs along Pine creek north of Sweetland. The region is an extremely interesting one. The flora represents an island where some northern and southern species have been preserved. It is isolated from the prairie species to the west and the common woodland forms along the river. The region owes its peculiar vegetation to climate, as well as physiographic conditions prevailing.

The sandstone is retentive of moisture and releases its moisture more slowly than limestone rock of the prairie region. Since it is densely covered with timber, snow remains longer during the spring and the plants are better protected than on the treeless prairies.

This region not only contains grasses which occur elsewhere in the

state, like bottle grass (*Asprella hystrip*), *Cinna arundinacea*, blue grass (*Poa pratensis*), little blue stem (*Andropogon scoparius*), rice cut grass (*Leersia virginica* and *L. oryzoides*), but the tops of open clay hills are covered with wild grass (*Danthonia spicata*), and on one or two of the clay ridges crab grass (*Panicum filiforme*), small and diminutive in most cases occurs; meadow grass (*Poa debilis*), first found by Barnes and Miller; dropseed grass (*Muhlenbergia sobolifera* and *M. Wildenovii*) are found in damp, shady woods. The rocky talus supports Goldie's fern (*Aspidium Goldianum*), wood fern (*Aspidium spinulosum*) and beech fern (*Phegopteris polypodioides*) only in one place. These species will soon disappear. Nearby is found Alpine enchanters nightshade (*Circaea alpina*). The rich woods contain another beech fern (*Phegopteris polypodioides*) in considerable quantity. Christmas fern (*Aspidium acrostichoides*) occurs in damp rich woods. Club mosses (*Lycopodium lucidulum* and *L. complanatum*) have both been found by Mr. Reppert on the sandstone talus. One of the hillsides contains a considerable quantity of huckleberry (*Gaylussacia resinosa*). It occurs with wild oat (*Danthonia spicata*) and crab grass (*Panicum filiforme*), hawkweed (*Hieracium scabrum* and *H. Canadense*) occur with oat grass (*Danthonia*). Both are rare in Iowa. Prairie clover (*Lespedeza reticulata*) and rattlesnake plantain (*Goodyera pubescens*) are associated with huckleberry (*Gaylussacia*).

The region is interesting because of the number of native ferns found there. I may mention the following ferns found by me on the trip made on May 18th: The rocks were covered with walking leaf fern (*Camp-tosorus rhizophyllus*), a little of the polypody (*Polypodium vulgare*), woodsia (*Woodsia obtusata*), maiden hair fern (*Adiantum pedatum*), Goldie's fern (*Aspidium goldianum*), small aspidium (*A. spinulosum*), spleen wort (*Asplenium felix*, *Foemina*), brake (*Pteris aquilina*).

THE NATURAL BRIDGE AND CAVES OF JACKSON COUNTY.

By James H. Lees, Geologist.

One of the most unique regions of Iowa, because of the rarity of the phenomena as well as of their natural beauty, is that including the natural bridge and the caverns known as the Morehead Caves. These are located in a small ravine about a mile from Maquoketa river in section six of South Fork township, Jackson county, eight or nine miles northwest of Maquoketa. They are a really wonderful group of objects, typifying as they do the great erosive and dissolving power of running water and combining in their features both the majesty and the beauty of Nature's work. As the observer studies their rugged form and massive proportions and considers the conditions which have given them their present-day shape he can not fail to be filled with increasing awe and wonder at the power of Nature's forces as well as with admiration of the results here accomplished.

The visitor who approaches the caves by way of the road from Maquoketa enters the ravine rather at a right angle to its length and may here cross it on a sort of platform far above the real floor, which may be

reached on either side by steep pathways. To the left the pathway leads down the sides of a great funnel-shaped opening strewn with boulders which are the remnants of the once solid rock which occupied this space. This funnel is perhaps fifty feet in depth and diameter and at the bottom it leads on one hand to a great archlike tunnel two hundred feet long which at the middle of its length is so low that one must stoop to pass through. At the far end, however, it opens into a majestic hall whose roof springs a clear thirty feet from the floor and covers a horizontal span of twice or thrice this space. In the winter great icicles hang pendant from the roof from the dripping springs which seep through the rock. Outwardly this natural auditorium opens to the tree covered slope of the ravine. When the writer visited the caves the trees were loaded with snow and the scene afforded by the white clad trees framed within the great portals of living rock was one not soon to be forgotten. Along the floor of the tunnel a stream at times winds its devious way, descendant and inheritor of that which performed this miracle of water wearing away stones. In the other direction the funnel leads to a narrow passage which passes under the platform already mentioned as affording a crossing of the ravine.

To the approaching visitor's right the pathway leads down the steep slope into a great cavity whose walls on two sides overarch in a cavern fifty feet deep and fully as wide. The narrow passage mentioned before opens into the base of this cavern as a low opening not high enough to admit of traversing, except perhaps on hands and knees.

The far side of the great cavity, that toward the open ravine, is limited by the arch of the natural bridge. Enthusiasm, however exuberant, is entirely pardonable in describing this beautiful span. While of course it is not comparable in dimensions with the immense natural bridges of Utah, so far as massive architectural beauty, the coloration of the rock and the crown of foliage which covers its summit, can compensate for smaller size, Iowa's natural bridge surely excels those of the barren west. The top of the arch is flat, perhaps forty or fifty feet above the floor of the valley and bears upon its broad back several large trees, besides a complete covering of smaller vegetation. The arch itself rises twenty feet or so above the base and is twenty or thirty feet thick. The growth of the lichens and mosses which covers the stone walls has given a delightful variety of pale green and dark green, in contrast to the reddish and yellowish tinge of the rock itself. No photographs can do full justice to such a noble subject as the caves and bridge, for to be appreciated they must be viewed from so many angles and points of vantage which the camera can not reach. A photograph at best can give only a fragmentary glimpse of the true beauties of gems of Nature such as these. Surely if there are any points of beauty anywhere in Iowa which are worthy of reservation and preservation by the State this is one of them, for nowhere else do we have just such natural features as these, features which will delight and reward the visitor for any outlay of time or energy necessary to acquaint himself with their beauty and value.

TOPOGRAPHY OF MOREHEAD CAVE AREA.

By T. E. Savage, Geologist.

Near the middle of the north half of section 6, South Fork township, is an area known locally as "the caves." These consist of a series of natural bridges that have been developed by the waters of a small creek eroding a subterranean passage, and the subsequent partial caving in of the roof of the cavern.

The upper or most northerly bridge has a length of 150 feet across the gorge and a width of about sixty feet. The stream flows in a channel about ninety feet below the top of the bluffs. It has carved a passage fifty feet in height beneath the span of the bridge. About eight rods further down the stream a second arch crosses the ravine. This latter is several rods in width, but is so choked with silt and driftwood that the passage can only be followed with difficulty.

A few rods further down the creek there is a sink hole sixty feet in depth, having a diameter at the top of seventy-five feet. Climbing down to the bottom of this shaft the explorer can readily follow an underground passage three hundred feet in length, forty to seventy feet in width and eight to twenty-five feet in height. At various points along this main passage there are to be seen entrances to smaller galleries which wind in and out along the sides and roof of the cavern. A beautiful spring, furnishing a stream of water four feet in width, issues from one of these lateral canals. At the lower end of the passage the stream emerges in a gorge whose bounding cliffs rise 125 feet on either side. This locality is a justly popular resort for drives and picnics for the people in all of the southwestern portion of the county.

In the southern part of Richland township, near the village of Cottonville, another series of caverns or underground passages have been developed.

Such channels are usually formed where streams having a steep gradient cut deeply into thick bedded limestones. Professor Shaler has shown that their genesis also requires forest conditions. As the rain water filters through leaf mould over woodland areas, it becomes charged with carbonic acid gas from plant decay. As this carbonated water slowly percolates along the crevices and joint planes of limestone strata, it gradually widens the fissures by taking into solution some of the material along the way. The amount of limestone thus dissolved by the water is always in direct proportion to the amount of carbonic acid gas that the water contains. As the passages become enlarged a larger volume of water follows them, and, in turn, the larger stream of water more rapidly increases the size of the channels by abrasion as well as by solution.

In the course of time the streams of such a region desert the surface, and find an outlet to their major streams through subterranean channels. If not too deep beneath the surface, the roof of these passages will eventually be broken through at some points giving rise to natural bridges. Gradually the underground channel may be converted into a gorge by the falling down of the roof along its entire course.—Geology of Jackson County, pp. 571-3.

THE MOREHEAD CAVES IN JACKSON COUNTY.

Maquoketa, Iowa, March 26, 1919.

Dr. L. H. Pammel, Ames, Iowa. Dear Sir: The Fine Arts Club of Maquoketa, has asked me to write to you in regard to an interesting tract near here, which we think should be placed upon the list of state park areas. It is known as the Morehead Caves. A really wonderful formation! There is what is called the "Pulpit," The "Dance Hall," The "Dining Room," ice cave and many other features. Persons have explored the caves going perhaps $\frac{3}{4}$ of a mile, coming out into another opening, over the caves where there is a fine forest which we fear is being ruthlessly cut down for timber. Thousands of people visit the caves every summer. We believe it should be developed into a very valuable area for our state, with small expense. Our club would be of service in every way possible.

May we hear from you?

Mrs. A. J. House.

FLORA OF JACKSON AND DUBUQUE COUNTIES.

By L. H. Pammel, Botanist.

The region, as a whole, along the Mississippi River and the tributaries, is extremely rough. The largest stream of the region is the Maquoketa river, with a flood plain somewhat wider than the other streams. The smaller streams are all tortuous and for much of their distance show vertical walls of limestone. In many of these places the valleys resemble canons. The hillsides for the most part were covered with forest trees. In some places with rough limestone exposure the hills were grassy with such grasses as bluestem (*Andropogon provincialis*), and small blue stem (*A. scoparius*) and Switch grass (*Panicum virgatum*). Many of the original grasses have been replaced by blue grass (*Poa pratensis*) but more especially (*P. compressa*), and annual grasses like Tickle grass (*Panicum capillare*). The limestone hills are covered with a variety of trees like the Bur oak (*Quercus macrocarpa*), white oak (*Quercus alba*), red oak (*Q. rubra*) and Chestnut oak (*Q. acuminata*). The barren oak (*Q. ellipsoidalis*), and Quercitron oak (*Q. velutina*) are common in soils containing some sand. On the hillsides such trees as white ash (*Fraxinus americana*), black cherry (*Prunus serotina*) Choke cherry (*P. virginiana*) and an occasional group of Pin cherry (*P. pennsylvanicus*) occur. The American plum (*Prunus americana*) is common everywhere. The wild crab (*Pyrus ioensis*) forms thickets everywhere over the hills.

During the month of April the woods are whitened by the blossoming of the Service berry (*Amelanchier canadensis*). Everywhere may be seen the vine of wild grape (*Vitis vulpina*), the bittersweet (*Celastrus scandens*), the honeysuckle (*Lonicera glauca*). A gorgeous display of the Columbine (*Aquilegia canadensis*) is found in every protected nook of the rocky shady declivities. On shady rocky hills the white flowers of the ninebark (*Physocarpus opulifolius*) make a splendid showing. A somewhat rare shrub, the buckthorn (*Rhamnus lanceolata*) occurs on the

limestone ridges scattered throughout the region. The paper birch, so common northward, is scattered here and there in Dubuque county, but so far as I know does not occur along the Mississippi river at Green Island.

A number of southern trees are found in the region, like the Sycamore (*Platanus occidentalis*), the honey locust (*Gleditsia triacanthos*) which occurs, however, to the north in Clayton county, while the Coffee bean (*Gymnocladus dioica*) occurs north in Minnesota. Both of these trees are fairly common. The swamp white oak is common on the Mississippi bottoms along with the soft maple (*Acer saccharinum*), cottonwood (*Populus deltoides*), hackberry (*Celtis occidentalis*). These counties contain several most interesting trees that belong to the south. The islands of the Mississippi subject to overflow contain the pecan (*Carya Illinoensis*). It is probably the most northern distribution of the species in the United States. Another southern tree occurs with it, the pin oak (*Quercus palustris*) this too is the most northern distribution in Iowa. It seems to me that a small portion of the area where these occur should be preserved. The wood of the pecan and pin oak is so valuable that the best of the trees have long since been removed. Cannot a small area be preserved here and there? In this same region may be found Lotus ponds (*Nelumbium luteum*) one of the interesting and unique plants of Iowa, its straight leaf stalks standing out of the water, followed by creamy yellowish white flowers raised on long stalks, and later the large top-shaped receptacles commonly called pods replace the flowers. The Indians when they were supreme in this region, gave some attention to the plant, because they used the thick rhizomes and seed for food.

It is worth noting here that when the American association met in Dubuque in 1871, and Dr. Asa Gray, the leading American botanist, delivered his presidential address, he made a special trip to McGregor to view the lotus beds. A Mr. Wright took the geologist, Dana, and the botanist, Asa Gray, to these flower beds.

Two other interesting aquatic plants occur in the region, namely the white water lily and the Spatter Dock. The low alluvial meadows of the Mississippi are fairly aglow with the Cardinal flower. Surely there is nothing in all of the category of late summer plants equal to the cardinal flowers and there are acres of them in this region. I cannot refrain from mentioning another plant of the region the paw paw (*Asimina triloba*). How many Iowa people know that this plant is a native of Jackson and Dubuque counties. Many years ago I made a special stop at Specht's Ferry near Dubuque to pick some of these plants. It was found in abundance at the base of the hill near the place, along with the mandrake, sweet william, blue and yellow violets and bittersweet, black walnut, American and slippery elm and hard maple. Some years earlier I had received some specimens from a Mr. Kenyon near McGregor, who supposed that the Indians planted it at that place. However, it is native near Dubuque and in Jackson county. Ferns are abundant. I never saw such an array of bulbous or bladderwort ferns as I found near Green Island, hanging from the limestone rocks. The limestone talus and cliffs support another interesting fern, the Walking Leaf Fern. There are also the ostrich fern, the Osmunda and Spleenwort. Of ever-

green trees in this region mention might be made of the white pine, red cedar, dwarf juniper. The quaking aspen and large toothed aspen are common on the hills. An abundance of the green ash (*Fraxinus lanceolata*) the almond leaved willow (*Salix amygdaloides*), sand bar willow (*S. fluviatile*) black willow (*S. nigra*), cordate willow (*S. cordata*) and prairie willow (*S. humilis*) are common generally in low grounds, except the last named species which occurs in little openings on the hills. Roses (*Rosa pratinicola* and *R. blanda*) are plentiful in woods and prairies.

SUGGESTED AND
CONSIDERED AREAS

Clear Lake, Cerro Gordo County.

CALVIN, SAMUEL
JONES, IRA W.
MCNIDER, MRS. C. H.
NETZER, G. M.
SONDROL, MRS. CARRIE P.

Decorah, Winneshiek County.

BAILEY, EDWIN H.
HOADLEY, B. W.
LEES, JAMES H.

Hardin County.

BEYER, S. W.
FOSTER, FRANK E.
PAMMEL, L. H.

Ledges, Boone County.

DIEHL, WM. W.
HENNING, CARL F.
PAMMEL, L. H.

Palisades, Linn County.

LAZELL, FRED J.
LEES, JAMES H.
NORTON, WILLIAM HARMON

Pilot Mound, Hancock County.

GILBERT, WINIFRED
MACBRIDE, THOMAS H.
MCNIDER, MRS. C. H.
SECOR, EUGENE

Sioux Granite, Lyon County.

BEYER, SAMUEL WALKER
WILDER, FRANK A.

Woodman's Hollow.

DRAKE, J. E.
FINDLAY, CHARLES V.
FULLER, HAL C.
HART, MRS. PERVILLA ALSEVER
PAIGE, F. W.
PAMMEL, L. H.
WILDER, FRANK O.

SUGGESTED AND CONSIDERED AREAS.

WOODMAN'S HOLLOW AREA—ONE OF NATURE'S BEAUTY SPOTS.

By Mrs. Pervilla Alsever Hart.

Among the many beautiful and unique places along the Des Moines river, is a valley, or glen, known to the inhabitants of Otho as Woodman's Hollow.

A long time ago, as early as 1855, it was owned by the government. Later, it became what is called, "River Land."

It was bought and sold several times, and finally became the property of a man named Woodman, from whence it derived its name.

The earliest inhabitants say that in 1855 the deer were running up and down the Hollow, and two wild cats were seen about one-half mile from the mouth of the Hollow.

This picturesque place is situated on the Des Moines river, some over two miles east of the little village of Otho, which is on the M. and St. L. R. R. The Hollow is about one-half mile long, running east and west.

At its source is a spring of clear, sparkling water, which feeds a small stream, running the entire length of the Hollow.

On either side of the stream are walls of rock, rising ten and twelve feet in height, while the tops almost touch in places, as they grow out from the hills, of which they form a part.

At the base of the rocks, the water has washed out the earth and left great, deep caverns, dark and weird looking, while out of the crevices and at the bottom, where the soil has washed down, there are tiny ferns protruding, and an occasional tree seed takes root, grows for awhile in a half-hearted, sickly manner, then dries up and dies. Sometimes, at irregular intervals, there are thrifty trees growing tall and straight, and reaching up, as though to catch the sunlight, beyond the gloom.

Around the spring, at the beginning of the cave, the most beautiful white sand is found, clean and glistening.

Above the chasm, and as though to shelter, it the trees spread their branches, interlocking their long arms on either side, and the sunlight glints through the branches on the rock bed below, while the roots are imbedded in the moist, rich earth, that forms the hill on either side.

Years ago there was an abundance of small cedar trees on the bank, but most of them have been transplanted to ornament the homes and farms throughout the township. There are but few cedar trees left, except several which were transplanted around the old Woodman house, which is now a thing of the past, but was once a beautiful home-like scene, on the north bank of the Hollow near its source.

The trees growing along the Hollow are popple, basswood, and a great many oaks. There are also wild raspberries, gooseberries and choke cherries.

But that which attracts the nature lover most is the abundance of ferns. Large and thrifty, they raise their airy fronds in the coolness and darkness, nodding and beckoning, living their simple sweet life all alone, only for the occasional passerby, and like the sweet wood violet, modest and unassuming.

The dainty little maiden hair fern clinging to the rock or dropping from some overhanging cliff, where it finds footing, is hailed with delight by the fern lover.

In the spring the little daisies, trillium, dutchman's breeches and wood violets, the sweet spring beauties and jack-in-the-pulpits grow round about where the sun reaches them, while below, in the fall the golden-rod and other autumn flowers make the hillside bright, while the many colored leaves, loosened from the trees by the fall breezes, sift down into the cavern, and make the rock floor bright, and soft, and comfortable.

As the foliage becomes thinner, the sun glints down thru the openings, as tho he would warm, by his bright rays, the rocks, and earth, and tree roots.

The moss, which is also luxuriant, tries to cover any unsightly places that nature has seemingly left, unfinished.

In the winter the snow covered rocks and trees stand out as sentinels, to guard the delicate ferns and flowers asleep below.

Woodman's Hollow is not rocky its entire length. At its beginning we see rocks on either side and on the bottom.

The opening is very narrow, so sightseers must travel single file. It gradually widens as it nears the river, until it measures about two hundred feet across its mouth. Here we find a beautiful island, on which is a large rock, which, because of its shape, is called Steamboat Rock.

As the Hollow broadens into a valley about ten or twelve rods from its source, the green grass and vegetation are quite rank, but there are no rocks.

Not far below Steamboat Rock is another beauty spot, called Boneyard Hollow, because of the bones found in the excavations of the mounds found there. But that is another story.

About fifteen years ago Woodman's Hollow was famous for picnic parties, botanists, and all sorts of nature lovers. Names innumerable are carved on its walls of stone. There are picnic parties to some extent now, but of late it has been allowed to grow up to weeds, and great trees are blown down, lodging across the stream. But the beauties of nature are still there.

The many rains, and the water from the river, which rises every spring, have washed the roots of the trees, down by the river, and they stand out, all naked and bare, while their great trunks rise above them, waving their long branches, inviting to the cool shade on the river bank.

After resting, and enjoying a drink from the spring on the island, the traveler starts up, and up, and up, past the little meadow valley, into the coolness of the forest, between the rugged rock walls, over the bogs and moss covered rocks, crawling between and under the low hanging rocks, up, and up, and up to the little spring at the source, then out into the open prairie, the green grass and bright sunshine.

There is a public road running to within one-half mile of the mouth of the Hollow on the south, and another road runs north of the Hollow, about eighty rods from it.

The beauty and grandeur, and vegetation are all there, and with a little work, this could be made one of the most beautiful nature spots on the Des Moines river.

WOODMAN'S HOLLOW AND WILDCAT DEN.

By L. H. Pammel, Botanist.

Webster county is one of the most pleasant, from the scenic and scientific standpoint, in the Des Moines valley, as shown by the following letter from Mr. Price, of Ft. Dodge, Iowa, to the writer, in which he makes the following remarks: "Some time last year I wrote you regarding Woodman's Hollow, just east of Otho, in Webster county. At that time you mentioned a desire to have that glen set off as a state park.

"For five years of my boyhood days, I lived in that vicinity, roamed the woods and explored all the many ravines formed by the small streams cutting through the sandstone formations on their way to the river.

"Of course the forest conditions that then prevailed have been destroyed and can never be replaced, but much of the natural beauty still remains and should be conserved.

"Having friends and relatives still living in the neighborhood, I have made several visits there within the last two years and have gone over much of the ground where I once hunted, fished and wondered at the beauties of Nature.

"I do not know whether you have further explored the immediate neighborhood and are acquainted with the wild country around the mouth of Prairie Creek east of the old David Douglas farm and south of the James Black farm.

"To my mind that is the most practical site for a state park, as it is easy of access, has much of the natural beauty of Woodman's Hollow and is large enough to accommodate camping parties and to give sites for cottages.

"There are several hundred acres of broken land of little use for either agriculture or grazing. It is true that the heavy woods that once covered all that section have been largely cut off, but many trees still remain and the conditions are much like a city park.

"I visited the place last year and gathered nuts where I once roamed and found that very many people frequent the spot for outings. There were perhaps a dozen autos there that day and the supply of hickory and butternuts was ample for all. Good fishing is to be found all along the river near the mouth of the creek."

Mr. O. M. Oleson and Mr. M. P. Somes, in speaking of the area in Webster county say:

"Webster county lies just north and west of the geographical center of Iowa and is somewhat larger than any of the surrounding counties having an area of 720 miles. The county is primarily a prairie county, its only

forests being narrow strips along the streams. The average elevation of the county as a whole is about 1,100 feet. Along the Des Moines river, which crosses the county from north to south, the forest fringe varies from a quarter of a mile to more than three miles in width and is made up of such trees as oak, hickory, elm, ash, basswood and the like. Both branches of Lizard Creek are wooded and Soldier Creek and most of the other streams have more or less of woods along them. The larger part of the surface of the county is open rolling prairie with a soil of "Wisconsin Drift" for the most part with a few morainic hills of coarse gravel, most noticeable in the northern parts of the county, but some isolated mounds in the south part are very striking.

"The natural drainage system of the country is quite young and the stream systems are comparatively simple. As a result of these conditions marshes, ponds and sloughs of considerable area abound, although these areas are now being reclaimed by ditches.

"In the southern part of the county the Des Moines and its tributaries flow through the Coal Measures Sandstones and their valleys are bounded by abrupt escarpments of the sandstone, with steep cliffs from forty to one hundred feet in height.

"Another element which perhaps enters into the conditions producing such an abundant and varied series of plants here, is the fact that the portion of the country about Fort Dodge, in the central part of the county, is underlaid by beds many feet thick of gypsum or land plaster, and while it has been contended that these underlying beds have no direct influence on the vegetation of this section, the fact still remains that the area near the exposure of the gypsum beds, viz.: the valley of Two Mile Creek, or as it is more familiarly known Gypsum-Hollow, and the Des Moines valley near Blanden's Mill have an entirely distinctive flora from any other points, not only as to species but as to relative density of growth."

Mr. J. F. Ford, of Fort Dodge, in a letter to the writer makes the following state: "I can appreciate fully the sentiment that moves Mr. Price to call your attention to the scenic beauty as well as to the scientific value of Woodman's Hollow, just east of Otho.

"I have been a little backward myself in calling the attention of the board to this and other places in this locality from the fact that there might be a tendency to criticise the board for selecting territory in the immediate vicinity of the homes of the members of the board. Nevertheless, after seeing all of the territories that we have gone over in the past few weeks and hearing them described in the glowing terms that I have heard, I feel that I have something in this locality to show the members of the board that has not been surpassed in any of the territory gone over up to this time. One thing I am certain of, that without going outside of the corporate limits of the city I can show the members of the board a view or vista, as it is termed, that is second to none on the Des Moines river in the state of Iowa.

"Personally, there are a few places that I would like to have included in our recommendations and before our work would be considered finished I should like very much to go over the territory referred to by Mr. Kelso in Jackson county, and I would like to have the opportunity of showing the

members of the board some of, what I would call, the natural scenic beauty of the Upper Des Moines river as well as the lower.

"In Mr. Price's letter he refers to the Herbert Pratt and Hudson Farms. I have known the Pratt and Hudson families for almost thirty years and the Black, he refers to, for at least forty years. I would not anticipate any difficulty in acquiring the property permitting access to Woodman's Hollow."

This region is an interesting one. The carboniferous sandstone outcrops of the Des Moines are a continuation of these occurring along the lower Des Moines to Ottumwa. Cordova, Red Rock in Marion county, Des Moines, the Ledges in Boone and at Frasier, where they are but slightly exposed. At Woodman's Hollow there are steep bluffs and narrow gorges and the Des Moines river flows along the sandstone rock outcrops. The hills are heavily wooded with black, red, white and bur oak. There are two hickories, the pignut and shellbark hickory. The black walnut grows along the streams of the Des Moines and the butternut on the sides of the gorges. The slippery American and corky bark elm are common as well as the basswood and black maple. The soft or silver maple, American elm and cottonwood are common in the alluvial bottoms. The ironwood and large toothed aspen are common in the hills. Of the vines, moonseed, wild grape, bitter sweet, and Virginia creeper may be mentioned. Box elder, service berry, black, choke and pin cherry, American plum and wild crab apple, smooth sumach, poison ivy, honey locust, and coffee beans are not uncommon. Common elder and several haws are common. The hills are covered with wild roses and prickly ash. Lead plant occurs on the sandstone rocks and the wild indigo along the river. The red cedar occurs in considerable numbers on the exposed sandstone outcrops along the Des Moines. Swamp ash, red ash, alternate leaved dogwood, the silky cornel and paniced dogwood, and black haw, as well as arrowwood may also be mentioned. The region abounds in ferns, like the spleenwort, ostrich, maiden hair, walking leaf, cliff brake, the small bladder fern, several rare species of sedges also occur. Of the other herbaceous plants mention may be made of the lungwort, mandrake, bloodroot, hepatica, wind flower, prairie cone flower, black eyed susan, everlasting, Philadelphia fleabane, silky leaved aster, hory gentian, sweet cicely, zizia, pimpinella, meadow parsnip, polytaenia, evening primrose, sweet william, alum root, wild strawberry, the common and the vesca, hog pea, vetch, two kinds of bush clover, tick trefoil, milk vetch, prairie clover, false indigo, seneca snake root and the bastard toad flax, yellow violet, common bluebird foot violet.

Many rare birds and mammals find refuge in this area. The region offers unusual facilities for the lover of plants. Owing to intensive grazing and the removal of the ostrich fern for cultivation, the region is apt in time, to lose its prairie aspect. The region is not far removed from Ft. Dodge and would give a large population easy access to spend a few pleasant hours away from the busy toil of modern commercial life.

A LETTER ON WOODMAN'S HOLLOW.

By Representative Charles V. Findlay.

One of the beauty spots in Webster county, known locally as Woodman's Hollow, in which as a boy, passing through the wonder age, I came often to this place to feed my fancy and lingered to marvel at its mysteries, and later in life I have retreated to this wonder spot to learn more of its secrets and dig deeper into its hidden treasures.

When I wandered through this Hollow forty years ago as a boy, I learned to know and appreciate trees and shrubs. I became intimately acquainted with many forest trees among them were the hard maple, black walnut, basswood, slippery elm, swamp ash, and the varieties of oak commonly found there. Among the shrubs could be found the buckthorn, moosewood, red cedar, wahoo dogwood and pin-cherry.

For years the annual Christmas tree for the Otho church was selected from the red cedars that graced these ledges. No one suggested that the hand of depredation should be stayed. Today the naked cedar stumps stand out prominently on bold rock cliffs to condemn us for the thoughtlessness of the early days. I have dug seedling cedars and transplanted them. Two magnificent specimens are now in the yard, on the old farm, grown from these little seedlings. These hills should be re-forested with the variety of trees and shrubs that have been the victims of ruthlessness.

I remember the tramps in this woodland in May, that would bring one suddenly and unexpectedly upon a few yellow lady-slippers, or a little later when one should come across the large white variety, or luckily, in the earlier days, one could find an occasional orchid. But, alas, those surprises are now less frequent because this nook where nature was once so lavish in producing the unusual plants is now subject to pasturage where nothing is sacred.

In the quiet nooks of Woodman's Hollow is to be found the paradise of ferns in unequalled beauty, variety and abundance. The ferns seen in the yards of Ft. Dodge residences have been secured from this supply which seems to be inexhaustible at this time, but they, too, must succumb to the inevitable unless some protection is offered. These rare plants are merely weeds to many.

I hope that this piece of woodland with its beautiful and rugged scenery, its sandstone ledges that cannot be duplicated in central Iowa, its noble trees, its rare wild flowers and shrubs, its cascades, its refuge for wild animals, and its retreat for the wild birds will some day become a state park.

When one has answered the wanderlust and spent a day in Woodman's Hollow, he cannot emerge from these depths without a larger appreciation of plant life, bird life, animal life, a better understanding of the geological formation and the mighty forces once at work that elevated this formation of the carboniferous age, and the vigorous erosion that followed and which is still silently at work on these massive walls.

To read and ponder over these pages from the book of Nature is to be led to a higher appreciation of the "Author of Nature."

BONE YARD HOLLOW.

By Hal C. Fuller.

Shooting out abruptly from the precipitous banks of the Des Moines river valley is Bone Yard Hollow, located two miles north of Lehigh. This hollow derived its name from the wagonloads of buffalo bones which have been unearthed there by the early settlers and later by the curio hunters who have found many fine specimens, not only of petrified bones, but arrowheads, Indian axes, and in 1915, a leaden plate was unearthed there with a Latin inscription which since has greatly interested historians. This leaden plate may attach to Bone Yard Hollow a national importance, for it is claimed that this plate was deposited there in 1701 by Father Hennepin and explorers. Curator Harlan interested Archbishop Ireland in the find and church history was resorted to to prove the authenticity of the plate.

Bone Yard Hollow is a narrow ravine running out perhaps three-quarters of a mile from the Des Moines river. A small creek flows at the bottom and the tiny valley between the perpendicular walls has a thick growth of small trees and farther back from the mouth of the ravine, ferns and other foliage growth is luxuriant. The abrupt cliffs on either side go up fifty to seventy-five feet, and it is claimed that in the days before the white man came to this locality that the Indians used Bone Yard Hollow for a trap for the buffalo. The bones of these animals which lay several feet in thickness, have been unearthed here. It is indeed one of the beauty spots of Iowa, besides being rich in early history.

WILDCAT CAVE AND WOODMAN'S HOLLOW.

By F. W. Paige and F. E. Drake.

Wildcat Cave is about seven miles southeast of Fort Dodge and perhaps two miles from the railroad station of Evanston. The deep valley in which it is located is a picturesque bit of natural scenery.

The valley is perhaps a mile in length and of an average width of about a quarter of a mile. The hills on both sides rise to a length of two to three hundred feet. The upper end is heavily wooded. The lower portion is mostly open grass land and opens out on the Des Moines river. Through its center, or cutting across from one side to the other, flows a brook, which, working through the long ages of the past is, undoubtedly, the geological agency which formed it. Near the upper end where the valley abruptly widens is the cave—several of them in fact. This side of the valley for perhaps a distance of half a mile, is bounded by a perpendicular wall of rock, fifty or sixty feet in height, at the base of which the ground slopes steeply to the valley below. A beaten path skirts the wall its entire length. The caves are fifteen or twenty feet in depth by thirty or forty feet wide, and of an average height of eight or ten feet. The rock is a soft sandstone with many large and small concretions embedded in it.

Above the caves, this wall of sandstone, carved and gullied by the weather, rises some fifty or sixty feet. Near by a path down a small ravine over a series of rock steps, gives access to the caves. The whole is thickly wooded and affords a retreat, which, on a hot day is deliciously cool. Just below the cave is a small spring of excellent drinking water. Above, the country is heavily wooded for some distance back, and both sides of the valley are clothed with trees. Just above the caves, there are excellent picnic grounds where the forest is open and the ground covered with greensward. This place is much resorted to for picnics, and is reached by a road through the woods.

Many rare plants grow in the valley and on the surrounding hills. maiden-hair ferns are abundant on the slopes, and in the woods below, grow the beautiful Virginia grape fern (*Botrychium Virginianum*). The Clayton's fern (*Osmunda Claytoniana*), the lady fern (*Asplenium filix-foemina*), the fairest of all our Iowa ferns. A deep and shady ravine, known as Drakes Gulch, cuts into one side of the main valley. This is a veritable fernery. The most abundant ground vegetation being the lady fern, with here and there the *Dryopteris goldiana*. But the most remarkable of all nature's productions is the walking fern (*Camptosorus rhizophyllus*). This peculiar plant, growing on large rocks, sends out long, slender and pointed leaves. The end of the leaf rests upon the rock, takes root and forms a new plant, the old part withering away. The new plant repeats the performance until the fern has traveled clear across the rock.

Woodman's Hollow is two or three miles southwest of Wildcat Cave, on the other side of the river. It is a deep narrow valley half the width of the former, and opens out on the Des Moines river. It is heavily wooded as is all the country in this section for a mile or so back from the river. The sides of the little valley are very steep and the upper end narrows into a gorge, with a low, perpendicular rock cliff on each side. These rock walls are covered with brilliant green mosses. It is a beautiful and picturesque little valley, and under the dense shade of the trees grows another large fern, peculiar to this locality—the ostrich fern (*Onoclea struthiopteris*). A small stream, the excavator of the valley, flows through it and empties into the Des Moines. In close proximity to Woodman's Hollow are other ravines, cut deeply into the earth, and so densely shaded that they are cool on the hottest days. Many rare plants besides ferns are found in these valleys. These cool retreats furnish an entirely different flora from the uplands. From the high points, three or four hundred feet above the Des Moines, beautiful views of the river can be obtained. The valley of the Des Moines here is rather narrow, and the heavily forested sides plunge steeply down to the water. For sheer beauty of scenery, I have never seen anything that surpasses it, although my travels have extended from the Atlantic to the Pacific.

GEOLOGY OF WEBSTER COUNTY.

By Frank A. Wilder, Geologist.

The Coal Measure sandstones are the striking stratigraphic feature in the southern part of the county where a maximum thickness of sixty feet is exposed. Most of the layers are ferruginous, but near Lehigh the upper courses at certain points are cemented with carbonate of lime. The bond between the grains is slight when iron is the cementing substance. The layers containing carbonate of lime, however, are firm and suitable for building. Typical exposures of these sandstones may be seen on Prairie creek in Otho township, section 35, the so-called copperas beds, and at Wildcat Cave in Pleasant Valley township, section 11 southwest quarter.

Webster county lies wholly within the area that was covered by the last great ice invasion, and the drift of this ice sheet, called the Wisconsin, forms almost everywhere the surface material. Limited areas covered by glacial material that had been recently reworked by streams, or by detritus formed by the very recent weathering of cliffs along streams are the only regions not drift covered. So recently was this drift deposited that erosion has but slightly contributed to the topographic features of the county. Only in the immediate vicinity of the Des Moines river and its tributaries are the results of water action apparent. Viewed from the valleys of the streams, the landscape seems extremely rugged, and it is a matter of constant surprise that, in a region so typically prairie, scenery so beautiful abounds. The sides of the valley are steep and well wooded from top to bottom. After ascending the sharp slope, however, the climber finds himself at once on the level prairie where often for miles he can see the stream as it flows through its V-shaped valley.

The entire county is drained by the Des Moines river and its tributaries. Most of the branches rise within or barely outside of the county and while still within its limits unite with the parent stream. Lizard, Soldier, Deer, Holaday, Brushy, Skiller and Prairie creeks answer this description. East and West Buttrick creeks, which drain four townships in the southwestern corner of the county, contribute their waters to the Raccoon which they meet in Greene county. The drainage system is not elaborate. None of the creeks in the county are perennial farther than a mile from their mouths. The creeks have no well developed subordinate feeders, and large stretches of country are dependent on artificial drainage. The contrast that Webster county presents in this particular with certain other parts of the state is made plain by a map drawn on a scale as limited as that of the railroad commissioners. The accompanying sketches which reproduce Ringgold and Webster counties illustrate fairly the difference in drainage between Webster county and the southern part of the state. Any county in the three tiers near the southern boundary would serve for contrast as well as Ringgold. Sloughs and ponds are common throughout Webster county, their number and size varying with the season of the year. The percentage of the land that is for this reason kept from cultivation, however, is not great. Yearly the number of ponds is being reduced by artificial drainage.—Iowa Geological Survey, Vol. XII, pp. 85-6, p. 69 and pp 72-3.

THE PALISADES SHOULD BE A STATE PARK.

By James H. Lees, Geologist.

Of all the beautiful places in Iowa which may claim the attention of the conservationists few are entitled to a larger share than the Palisades of the Cedar river. Rising sheer from the water's depth, decked with the everlasting green of the conifers which find root and resting place upon their perpendicular faces, they offer a never ending delight to all the aesthetic senses as well by their massive dignity and majesty as by the peaceful beauties of the scene of which they form so conspicuous a part. For a space of two miles or thereabouts these rugged rock walls border the river, in the upper part of their extent chiefly on the east bank, in the lower part largely on the opposite side. The Palisades have always enjoyed a just popularity, with the country folk round about as well as with the people of the nearby towns, Cedar Rapids, Mount Vernon and others, and the building of the interurban railway between Lisbon and Cedar Rapids, with its Palisade station only about a mile from the Upper Palisades, has increased this popularity in a degree commensurate with the increased ease of access.

The Palisades are cut in limestone and dolomite of Silurian age, and the rough, rather coarse texture of the rock lends itself admirably to the handiwork of nature in carving out the massive, irregular walls which form the river gorge at this point. Bedding planes are almost absent and the entire face seems to be a solid, homogeneous escarpment, broken only by a cavern here and there or by minor etchings of the graving tools of time. Probably this homogeneity has been an important factor in preserving the Palisades from destruction or burial by the breaking down of masses of rock which would tend to conceal the bases, at least, of the vertical walls. Instead of this in many and indeed in most parts of their extent the Palisades rise directly out of the water, above which they stand at heights of thirty, fifty and as much as eighty feet. The Palisades are not continuous walls but are broken here and there by lateral ravines which have been cut by wet weather streamlets rising in the uplands and the hill country above the river valley. These ravines and gullies afford means of easy approach to the river and some of the larger have been utilized as building sites for some of the numerous summer cottages which dot the banks on either side of the river. Opposite the Upper Palisades and across the river, there is a low flood plain backed by fairly gently rising hills. Across the stream from the Lower Palisades a narrow rock platform stands rather high above the water and behind it rise the hills, either as smooth slopes or broken by low brown walls of jutting rock. To the south this platform descends to a low flat. In places it is absent and the cottages here are built on the high slope which breaks off abruptly at the summit of the vertical river wall.

Much of the country adjacent to the Palisades is still timber covered, although of course little or none of it is primitive forest. A good deal of cutting is being carried on and as it is safe to say that adequate steps toward reforestation are not being taken there is danger that

much of the beauty and charm of this region will be destroyed if means are not taken by the public to defend its own rights. It can not safely be forgotten that the public has rights here, even though the land may be entirely under private ownership. The public is the first owner and its claims are paramount, though nearly always obscured and lost sight of by the more insistent demands of private possession. Judicious timbering, of course, may be beneficial, but intelligent application of the principles of forestry is rare. The writer has only recently seen example after example of wood cutting on steep slopes and hillsides which was leaving these spots bare and ugly, destroying the minor vegetation and exposing the land to devastation by erosion, which will be certain to begin quickly and to work surely.

One of the most striking features of the Palisades is the large number of evergreen trees which dot their surface. These are found not merely as a fringe covering the summit of the walls, as is commonly the case in northern Iowa, but upon nearly the whole face may be seen the low spreading ground spruce or the gnarled, twisted, knotty trunk of the hardy cedar. No doubt this condition is due largely to the character of the rock, which here weathers into an exceedingly uneven surface which gives some footing for the roots of these daring wanderers. The cliff making strata of northeastern Iowa, on the other hand, weather with smoother faces, and thus afford little opportunity for the growth of trees. But it is a never-ceasing wonder how these trees, hardy as they are, can find moisture and food sufficient to permit even a precarious existence upon these barren rock walls.

The Palisades of the Cedar are one of nature's parks. No one who has seen them even casually, as it were, will dispute that fact. The public should have ready access to and free use of the advantages and opportunities for rest and recreation and aesthetic development which they afford. This statement is equally axiomatic with the other. In such a case, therefore, it is time that the public, through its organized machinery of government, should move forward and take steps to come into possession of its own. The cliffs, the river, the hills, the trees, the flowers, the birds are a group of jewels set by a master artist. Let one be mutilated or destroyed and the beautiful harmony of sight and color and sound will be impaired. Already the region is a game preserve. Let us make it also a rock preserve, a flower preserve and see that nature is given opportunity to continue the work so well begun.

THE PALISADES OF THE CEDAR RIVER.

By Fred J. Lazell, Author.

There is much similarity between the Palisades of the Hudson and the Palisades of the Cedar. Both front the river in vertical cliffs; both afford the most picturesque scenery on the respective rivers; both were in danger of being despoiled by stone quarry operators and other commercial interests; and both areas ought to be state parks. New York

and New Jersey have purchased the Palisades area, saved the famous cliffs from spoliation, and, provided the people of both states with a splendid park. Iowa has not yet purchased the Palisades of the Cedar; but at least 100,000 persons in the eastern part of the state are earnestly hoping that this will be done.

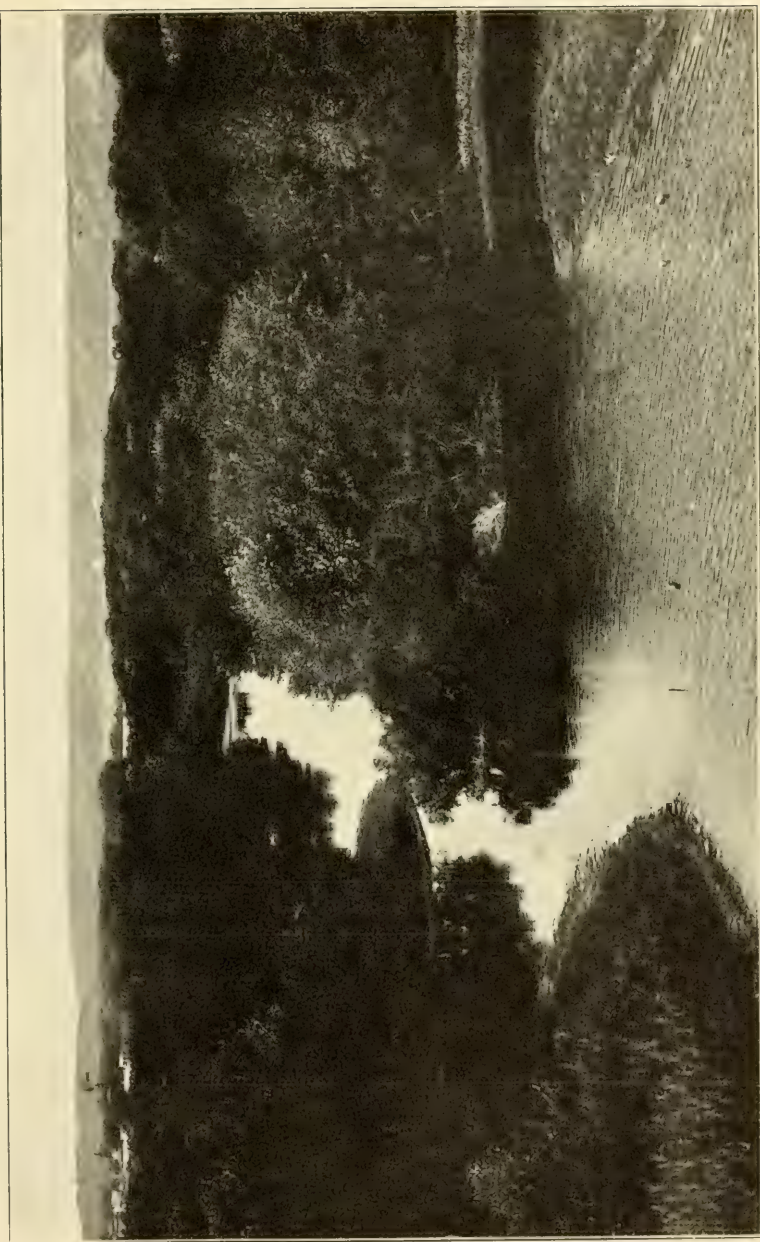
The Palisades area is located on the Cedar river between Cedar Rapids and Mt. Vernon, 15 miles from the former and 3 miles from the latter city. The entrance to the wooded area is within two miles of the famous Lincoln highway. The Northwestern railroad and the Cedar Rapids, Mt. Vernon and Iowa City Interurban both have stations within three miles of the cliffs. From Cedar Rapids the place is easily reached by launch and motorboat.

The cliffs are of the Upper Silurian dolomite, by McGee called Niagaran, and by Hall, Norton and Keyes, the Le Claire. For more than a mile they run straight up from the water, from fifty to one hundred feet high. The cliffs apparently consist of one massive layer of dolomite, undivided by bedding planes, although there are variations in the hardness and the texture of the rocks which produce great holes and caverns, locally called "blowouts". On the east side of the river citizens of Mt. Vernon, Cedar Rapids and Chicago have purchased land for summer cottages, along a small portion of the river front. But this interferes very little with the aggregate area which is all wooded for a distance of more than a mile north and south and a width of half a mile east of the river. On the west side of the river there are but one or two houses. The whole area is well timbered with many fine old white oaks, ash, elms, red and white hickory, black and white walnut, linden, red and yellow oak, aspen and hop hornbeam.

Drainage from the hills above, aided by springs from the base of the cliffs have broken great waterways through this Le Claire escarpment. These are locally called hollows, viz. Spring Hollow, Dark Hollow, Sleepy Hollow, etc. At Spring Hollow you must walk from the river half a mile up and across the creek seven times until you come to its source, a bubbling spring gushing from the pure sand at the base of a forty-foot cliff.

These lofty cliffs are fringed with some fine specimens of red cedar, some of them more than a foot in diameter. Down the northerly faces of the cliff the *Texas canadensis* commonly called American yew, or ground hemlock, sprawls luxuriantly, making a most beautiful picture at all seasons of the year. This is said to be the most southern limit for the growth of this interesting plant.

On the brinks of the cliffs the shadtree breaks into clouds of snowy sweetness, during April showers and sunshine, when the doors of the springtime have swung wide open to admit the passage of birds and flowers. On the rocky ridges the *Viburnum dentatum*, prickly ash and the American bladdernut are mingled with the commoner Iowa shrubs. Most of the area has never yet been pastured. In the lesser ravines, as yet unprofaned by the hoofs of cattle, the cypripediums, the Orchid spectabile, and the *Pogonia pendula*, are still to be found by those who search out beauty as a hunter seeks for game.



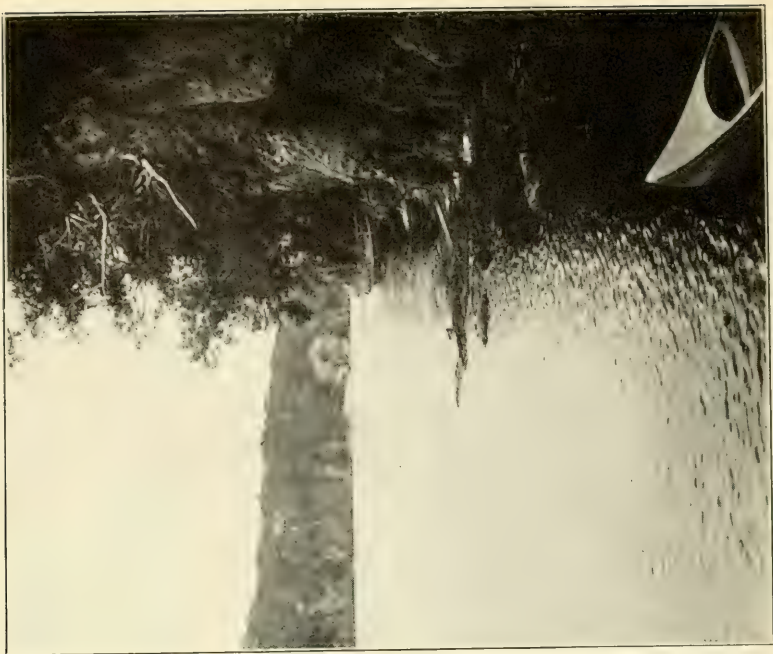
Little Sioux River at Sioux Rapids, Buena Vista County.



Grand View, Upper Iowa River, Decorah.



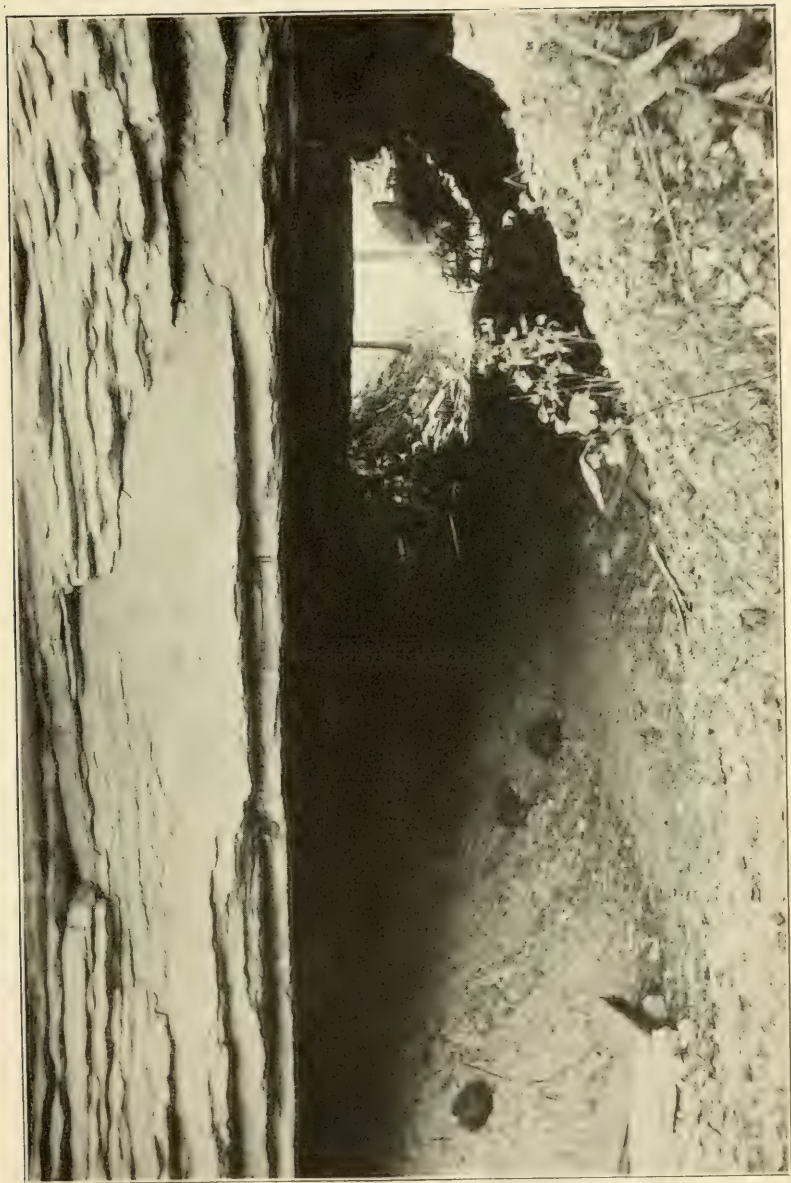
Entrance to Ice Cave, Decorah.



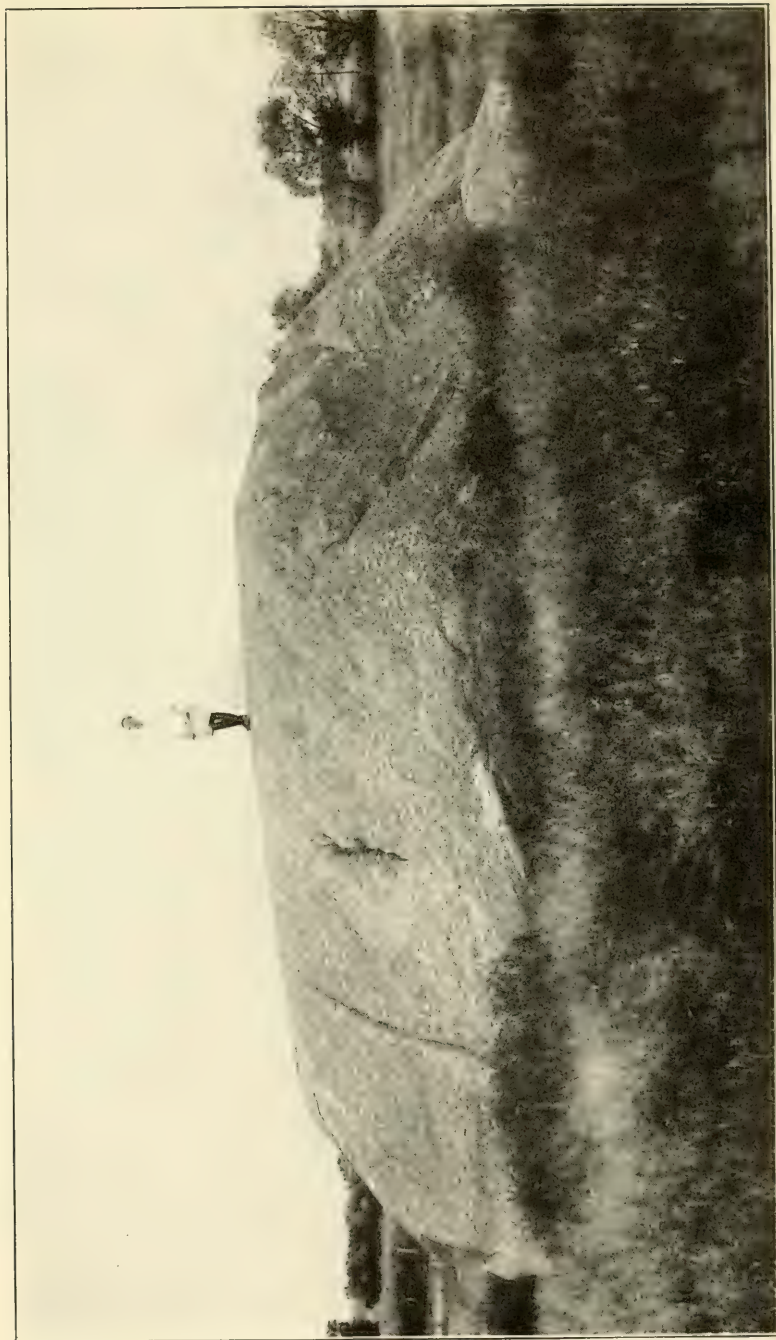
Palisades, Cedar River, Linn County.



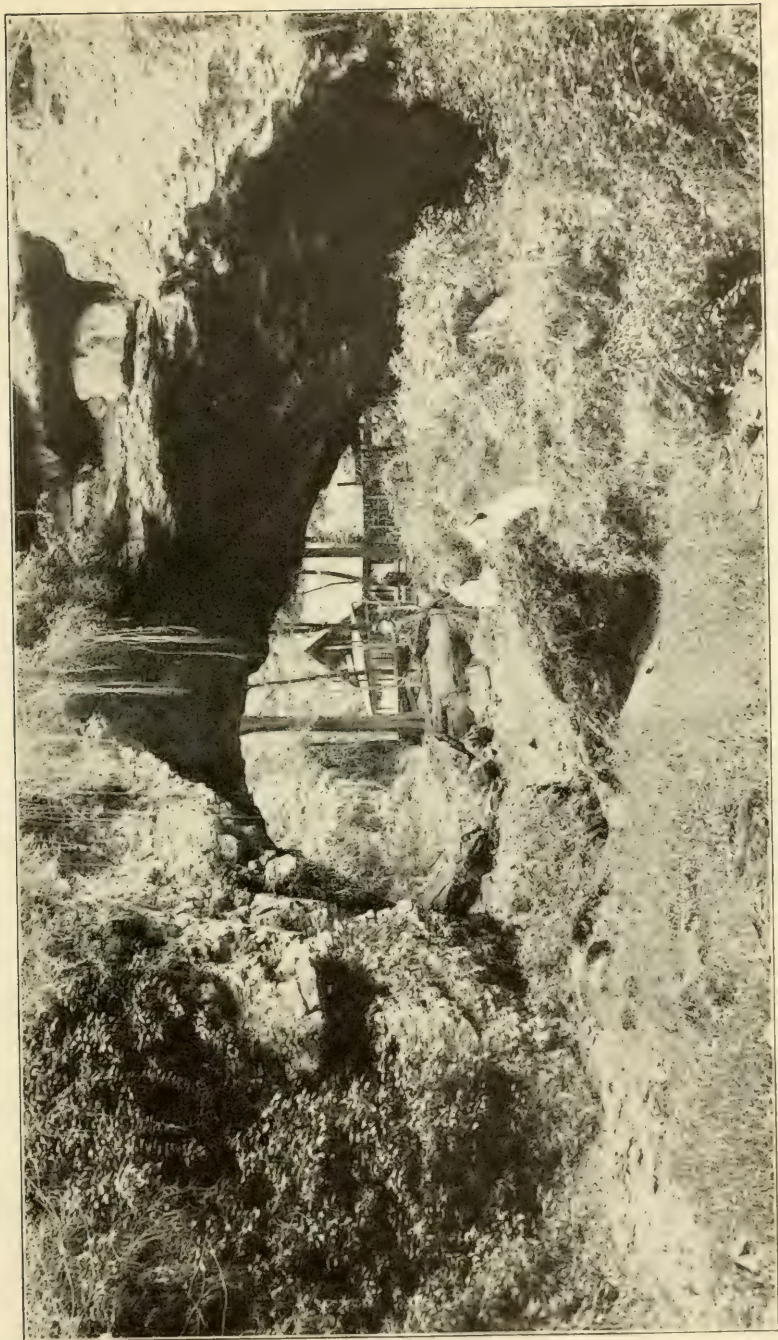
Lady-slipper, Steamboat Rock.



The Backbone Tunnel, Madison County.



The Big Boulder, Southeast Part of Floyd County.



Natural Bridge Near Maquoketa.



St. Donatus (Tete des Morts), Jackson County.

On the northern sides of the great hollow *Marchantia* covers the moist faces of the rocks like a carpet sometimes in patches twenty feet square. *Campanula rotundifolia* is abundant, while *Polupodium vulgare* and *Pellea atropurpureum* are not rare. *Cystopteris fragilis* and *Bulbifera* are common and the *Woodsia obtusa* may also be found. In the ravines *Botrychium virginianum* and *Phegopteris nexagonoptera* may also be collected, the latter often growing with *Asplenium angustifolium*. On portions of the alluvial area the giant fronds or the plume-like fruiting fronds of the ostrich fern may be found.

Great masses of talus are covered with the *Camptosorus rhizophyllus* the walking fern, which is perhaps more abundant at the Palisades than in any other place in Iowa. With this walking fern grow some of the finest of the mosses, such as the *Climacium Americanum* or tree moss, the *Thuidium delicatulum* and other fern mosses with *Pohlia elongata* where the water trickles down the rocks and great masses of the yellow-green *Brachythecium oxycladon* upon the prostrate trunks of trees laid low by many a mighty torrent.

Hydrophyllum appendiculum the appendaged waterleaf and the commoner form *H. virginicum*, grow in profusion among the talus at the bases of the cliffs, together with the bladder-nut, the ninebark and the burning bush. The one-flowered cancer root, *Aphyllon uniflorum* and the Indian pipe (*Monotropa uniflora*) are plentiful. There is something to delight the eye and to stimulate the mind at every season of the year.

In the caverns up the faces of the cliffs, the turkey vulture sometimes rears her young and occasionally you may see her sitting in the opening with her big wings spread to the sun as your boat glides by. High on the hills, beneath her two speckled eggs in a small depression among last year's leaves and not far away may sometimes be found the nest of the ruffed grouse, a bird becoming all too rare in our state. Occasionally one may find this bird sitting on her nest and still more rarely stumble on the young chicks newly out of the shell—so recently indeed that the mother bird has hastily ranged them around the edge of the nest until she has time to carry them farther away. The blue gray gnat catcher and the Acadian fly catcher are other interesting birds of this beautiful bit of woodland, both of them nest there. So does the prothonotary warbler. The blue grosbeak, very rarely seen in Iowa, is also found here. The nests of the cardinal grosbeak and the Cedar waxwing are common. There are hundreds of phebe's nests on the faces of the cliffs, near the surface of the river and above the little brooks in the hollows. These nests are built of moss and are fastened in the little pockets of the rock.

Some of the rare wild animals of the state frequently are found here. The badger which was once reported extinct for Iowa is fairly common, so is the opossum—almost the northern limit for this marsupial. The raccoon, the skunk and the mink are plentiful, also the groundhog and occasionally a fox or a wolf.

The Palisades area is of the utmost scientific value for the state university at Iowa City, Cornell college at Mt. Vernon and Coe college at Cedar Rapids. Students from all of these institutions spend much

time there. It has also many recreational advantages and if preserved as a state park with warden to protect it against vandalism would give enjoyment to tens of thousands of the state's population and also preserve some of the natural beauty that makes Iowans envied by visitors from less fortunate states.

GEOLOGY OF THE PALISADES.

By William Harmon Norton, Geologist.

The Le Claire beds reappear at Mt. Vernon and Lisbon, and on the Cedar they outcrop at intervals from the south county line to Ivanhoe bridge. Above this point they front the river in vertical cliffs, locally called the Palisades, nearly to Cedar Springs hotel southeast of Bertram. The outcrops gradually increase in height from the county line until about a quarter of a mile below the hotel where the maximum height of eighty-nine feet above water is reached. From this point (Twp. 82 N., R. VI W., sec. 14, NW qr., NW $\frac{1}{4}$) the Le Claire rapidly sinks and, in less than half a mile, disappears beneath the flood plain of the river. From the summit to the base these cliffs are, for the most part, formed of one massive layer undivided by bedding planes and unbroken by lithological alterations. While the road is broadly homogeneous, there are slight variations in hardness and texture, producing cavernous recesses in its walls and the irregular relief characteristic of long weathered surfaces of this dolomite. Near water level rude and inconstant courses, approximately horizontal, appear in places. Below Ivanhoe bridge bedding becomes more distinct and extensive in the rock, the dip being gentle and somewhat various.—Iowa Geological Survey, Vol. IV, pp. 129-0.

CLEAR LAKE SHOULD BE A STATE PARK.

From a Letter From Ira W. Jones to Secretary E. R. Harlan About Clear Lake.

I wish to call your attention in this matter to Clear Lake, and before the property has been definitely selected for purchase would like to have the privilege of taking up with your commission a proposition for a state park bordering upon Clear Lake.

Considering the great number of tourists that come here from all over the state and even out of the state, I do not believe there is another place in the state where the people generally would receive so much benefit from a state park as they would at Clear Lake.

I would be glad to hear from you regarding this and as to when and where it would be possible to take up the matter with you.

CLEAR LAKE.

By Mrs. C. H. McNider.

Mrs. Carrie P. Sondrol who represents our interests at Clear Lake will send you something of the situation there. Mrs. Sondrol has worked faithfully for several years trying to arouse the business men and others to the importance of providing for the future by setting aside certain tracts of woodland bordering on the lake. This has been too long neglected, but there are still available a few desirable tracts of good size to choose from and also a number of attractive small spots which I think should be considered even though they are not on the market, but they are especially suitable for resting and picnic places for motorists and to provide passersby with a glimpse of the lake.

The greater part of the shore is bound to be used for cottages within a few years and if any of its beauty is to be saved for the enjoyment and use of the public, it must be reserved soon, and the kind of recreation which these pleasant shaded places would provide is greatly needed for the comfort of the crowds of visitors who are attracted by the lake.

CLEAR LAKE.

By Mrs. Carrie P. Sondrol.

One of the favorite sites for a lake park lies just south of the town of Clear Lake. This tract covers about fifteen acres and is virtually as nature left it. One of its most attractive features is the outlet of the lake which divides it along the north end, here especially may be found native wild flowers in abundance. Among these may be mentioned timber violets (*Viola cucullata*), blood root (*Sanguinaria canadensis*), bell-wort (*Uvularia perfoliata*), wild spikenard (*Simulacina racemosa*), Solomon's seal (*Polygatum biflorum*), wood anemone (*Anemone quinquefolia*), wild strawberry (*Rose rubiginosa*), spotted touch-me-not (*Impatiens biflora*), many asters, daisies and golden rod. Along the edges of the outlet may be found the broad leaved arrow head (*Sagittaria latifolia*), blue iris, or Fleur-de-lis (*Iris versicolor*), and later the cattail and burr-reed. The land is well sodded to native grass. The trees are all native and include basswoods, elms, burr oaks, jack oak, ash, hickory, willow and a few butternut, wild crab and thorn apple. Many of these are large, splendid specimens which add greatly to the land value, from the conservation standpoint. Another important factor in favor of this strip of ground is that it is comparatively long for its acreage, giving a greater lake frontage where the beach is sandy and slopes gently out to the deeper water.

Further to the south of the lake is another strip of native timber varying from 100 to 500 feet in width with about one mile of shore line. The soil here varies from stretches of almost pure sand to bluffs of clay rising from 40 to 50 feet above the level of the lake. With the variation in soil we find a greater number of natural

wild flowers including besides those above mentioned many milkweeds and thistles, wild columbine, meadow rue, wood and Turk cap lilies, spiderwort and others. The timber varies more in size but includes practically the same species.

The abundance of timber and natural bushes makes both of these sites favorite haunts for many of our summer birds, while the water attracts the King Fisher, an occasional woodduck and others not commonly found.

Walnut Grove on the north shore of Clear Lake is a beauty spot noteworthy and deserving of attention because of the trees which give it its name. The grove itself comprises about ten acres, is accessible to the lake and surrounded by a country of surpassing picturesqueness. It is well wooded with a second growth of walnut trees, some oaks and other varieties, and has the advantage of lying near the corporation line with an adjoining golf course. But it is the walnut trees and their preservation that appeals to the conversationalist and it is in them that the desirability of this tract of land lies.

Situated on the south shore of the crystal waters of Clear Lake, is a spot that thrills the spectator with its natural beauty. It is known as the Oakwood Park Hotel grounds and is a point that juts into the lake giving a view that includes nearly the entire shore line. To the left is the beautiful island with its high banks and wooded slopes; directly in front, on the north shore, is the town of Clear Lake, with its hotels and summer cottages on the water's edge, while to the right, the view includes a broad expanse of sparkling water with the entire heavily wooded east shore. To the lovers of nature it presents a picture never to be forgotten.

The bank varying in height from ten to twenty feet, slopes to the water's edge, and is covered with native vines, sumac, bittersweet, and small shrubs, and in season is bright with wild honeysuckles and sweet Williams. In the foreground is a picturesque thorn apple of great beauty, while all about are stately trees. The elm predominates, but linden, ash, oak and hackberry are all represented. This tract comprises about 700 feet of lake shore and with the adjoining unplatted ground contains several acres.

The largest tract of undeveloped timber bordering on the lake, is the Parker property on the southwest shore. It contains about thirty acres with about eighty rods of water front. All this is heavily wooded and much as nature made it. The trees are large and very plentiful, including nearly every variety native to this latitude. Elm, oak and linden are the most numerous, though ash, butternut and black walnut, cherry and hackberry are very common. Wild flowers of all kinds are abundant, and the woods resound with the songs of native birds. This is one tract of lake shore of surpassing beauty that has escaped so far the commercialism that many of our tracts of lake shore have met with and would make a park with an abundance of shore line, clothed in the beauty with which nature endowed it.

SOURCE OF WATER SUPPLY OF CLEAR LAKE.

By Samuel Calvin, Geologist.

No surface streams flow into Clear Lake. Union and Clear Lake townships are practically destitute of developed drainage courses. The storm waters flow from the hills to the lower levels, but here they move sluggishly along the bottoms of broad grassy swales or through sedgy marshes and, before being gathered into definite streams, are largely lost, partly by evaporation and partly by percolation into underground channels. The popular belief among the local inhabitants that Clear Lake, which receives no surface streams, must be fed by springs, is doubtless true, for it would be reasonable to suppose that some of the water that sinks into the ground in the hilly regions north and south of the lake, would find its way along the horizons of sand and gravel into the lake bed. The undrained, saucer-shaped marshes or kettle holes characteristic of the morainic area were noted under the head of topography, and it was also noted that the basin of Clear Lake is only a large kettle hole, or depression in the drift materials of the moraine, and is not necessarily connected with any special configuration of the underlying indurated rocks.—Iowa Geological Survey, Annual Report, 1896, Vol. VII, p. 142.

CLEAR LAKE, AN IOWA PLAYGROUND.

By G. M. Netzer.

To have lake breezes blow fresh and full across one's face; to drink in the tonic of invigorating lake air; to see the sky other than through a smoke film; to see the moon in its greatest glory and the sunsets painted in multi-color; and to live real close to nature—all these await the visitor who makes Clear Lake, Iowa, his home for a summer season.

It is natural, then, that men and women, and particularly the men and women of Iowa, should go to Clear Lake to enjoy that sort of a vacation, which leaves them refreshed and rested in mind and body.

The resort never has to point twice to the same endowment or to play twice its themes of enjoyment. It has given vacation a new meaning and recreation a wider range. This is pleasing to the visitor and of immense satisfaction to the hospitable people of Clear Lake, who bid them welcome. Clear Lake feels secure in its prestige, yet eager to induce others to make the discovery for themselves. Pages might be written, piling statistics of this latent power to please, yet that would not suffice to give one in need of an outing the true conception of this charm, so seldom found among playgrounds for grownups.

Imagine, to begin with, a great fertile area of agricultural Iowa, teeming with its fruitage of corn, kindred grains and its stock, tilled and kept by a husbandry alive to every modern means of comfort and thrift. Let imagination lead you through these fields traced by trunk lines of the chief railroads of the middle west, which contribute their service to

make enjoyable the journey from home to this pleasing ground. The Chicago, Rock Island & Pacific; the Chicago & Northwestern; the Chicago Great Western; the Chicago, Milwaukee & St. Paul, and the Minneapolis & St. Louis join their steel lines, continental in extent, within ten miles of the lake shore. To ride over these lines in the richly appointed trains, to the man in health, seeking rest and recreation, to watch the bulging farmsteads, the sentinels of the surrounding wealth-giving fields, is a pleasure of rare worth. Before the visitor even comes to the final stage of his journey he will experience the thrill of a new life, and when he again selects a vacation spot, it will be Clear Lake.

The farthest corners of the state are but a scant twelve-hour journey from Clear Lake; Illinois and Wisconsin points but little farther. Marshalltown, Council Bluffs, Sioux City, Des Moines, Dubuque and Fort Dodge are but one-half the distance, and intervening points to these important Iowa centers have no difficulty at all in making the journey.

An interurban line, with hourly service, links up the last lap of the journey.

Clear Lake is no new discovery. It dates back to the glacial age.

Nature did not drop this lake down among mountains where it would be robbed of much of its charm by their majestic loftiness. Nor need the traveler seek amidst desert sands for this prize playground. None of these. Nature, that kindly god-mother of all ministering agencies of mankind, stole out upon the open plains, where her children now dwell upon her yielding fields, scooped out the firmer sod and filled the basin with laughing, shimmering water.

And when the lake was found, her discoverers could think of no more fitting name as they looked into her cooling depths and watched the waves wash and tumble the whitened pebbles along the shore line, than "clear," and Clear Lake it has remained. The name is not famous only as pleased pilgrims give it fame.

Men who are able to read nature's book with the keenness of the student mind, record that Clear Lake of itself, is distinct. It claims no kinship to any other body of water. Lakes go in families and owe their being to parentages geologically traceable. The thousand and one lakes that dot north Iowa and Minnesota are in groups and belong one to the other. But Clear Lake is none of these. It is unique, alone, an orphan among the lakes.

No underground channels lead from the beds of other lakes to thereby rob her of her waters in time of need. Her waters are not born of the fleeting snow. No growling glacier disturbs her in her bed, nor does she owe aught to the whimsical shower. Her waters are fed from fountains of perpetual springs, safely hidden beneath her surface, whence no one has yet gone and returned to tell of them.

Peace rests with her. No restless spirit troubles her. No dangerous reefs or hidden shoals fret the mind of the amateur boatman to make his voyage dangerous or uncertain. Fitful gusts and sudden squalls seek her fair surface. Childhood and youth may plow her waters with security. There are no shelving shore lines to trap the unwary. The clean white sand of the lake bed receded from the surface of the water inch

by inch, leaving ideal conditions for the sports of bathers and where children may play as secure from harm as if they were upon the lawns of their cottage homes.

If the visitor wishes to live under canvas, the wish may be gratified, for ample space will be afforded upon which he may pitch his tent. If, on the other hand, he desires a more conventional habitation, hundreds of cottages stand invitingly open; as many homes will afford him a welcome, and choice of hotels will minister to his need.

There are the country club, the golf links, tennis and dancing. There are drives and promenades, shady trees or open grass plots—all pleading for his attention. And with all these comes the rarest of all outdoor diversions—boating, bathing, fishing and picnicking. So, exhausted vitality is coaxed back, if not in one way, then in another.

Watercraft of all descriptions invite the visitor's indolence, his prowess or his daring. Red-devil racers and sharp-keeled yachts stir his sporting blood. Launches flit or sway with easy grace hither and thither. Rowboats fleck the surface and respond to every effort at the oarlocks. With generous courtesy the visitor will be shown the haunts of pickerel and pike, where the rock bass hide and the croppy and sunfish make their homes and where the trout and the bluegills and kindred finsters may be angled. He can be sure that each season's catch will not be less than the preceding, for care is taken to liberally restock whenever the finny tribe show signs of depletion.

And then for the daily plunge. No place along the shore boasts of advantages over another. There is sure to be variety of depth and the proverbial shingly bottom. Tired of paddling around, he may take the chutes for a thriller or two.

Then, camera in hand, you may go on a voyage of discovery. Kodaking is now one of the common arts. The result will be some rare gems of memory to keep green the lure of Iowa's happiest playground.

IN THE SWITZERLAND OF IOWA.

By Edwin C. Bailey.

The history of Decorah dates from June 10, 1849. On that day an emigrant wagon, following an Indian trail, found its way to a large spring near the banks of the Upper Iowa river. The dominating spirit of that little band of pioneers was "Mother" Day, its other members being her husband and three sons. "Uncle Billy," as the elder Day was known, had chosen a location some dozen or more miles southeast on a beautiful prairie, but when "Mother" Day saw it she would not locate where running water did not exist. The trek was resumed, and this may be regarded as fortunate for the present day residents of the locality that she chose as her home, for her arrival marked the beginning of a settlement that in a few years became a thriving village and that later developed into one of Iowa's most beautiful and prosperous cities.

Near the spring referred to the Days built a log cabin. They were Virginians of the better type, and an inherent hospitality made them logically the keepers of the first place of entertainment for the weary traveler. Here had been the "Neutral Ground" where the Winnebago Indian was free from molestation by the more warlike members of other tribes. Winneshiek and Waukon-Decorah were chiefs of the tribe, and it was from these two that the county and the town derived their names. The Day hotel was known as "The Winneshiek," a name that has clung to the successors of their humble cabin hostelry.

Not until 1853 did the population of Decorah show a marked increase, but from then on its growth was both rapid and substantial. In 1860 it claimed 1,200 souls. In those days, when the stage coach was the chief means of travel, the known settlements of importance west of the Mississippi were Dubuque, McGregor's Landing, Decorah, Fort Atkinson, Rochester and St. Paul. The Indians told of Minnehaha Falls but never spoke of Minneapolis, for it was not.

Among the early settlers of this region there came many of foreign birth. Norway was most generously represented and the descendants of these early pioneers, with others that came later now number about 40 per cent of the population of the county. They settled mostly near Decorah and it is to their credit that the first school of the county grew out of their desire for education. The building which housed this school still stands.

In 1853 there came directly from the University of Christiania, Norway, Rev. Vilhelm Koren. A cultivated gentleman of aristocratic lineage, he saw a field here among his countrymen and with his wife took up his residence in a log cabin a few miles south of Decorah. His parish was known as "Little Iowa," but it extended from the Mississippi west and north over Iowa and into Minnesota for a distance of a hundred miles or more. The same year that he took up his work here the Norwegian Lutheran Synod of America was formed. The natural outgrowth of this organization was a church school that combined scholastic and religious training. After an existence of about two years at Half-way Creek, Wisconsin, Luther college was moved to Decorah in 1861. It was largely through the instrumentality of Rev. Koren that this change came about, and in anticipation thereof he secured an option on a slightly location just at the northwest edge of the town. Here a handsome building was erected. Later years have seen modest efforts at landscape gardening and the adornment of the campus with other buildings. From its drives beautiful views along the Upper Iowa river may be obtained. On its campus spirited athletic contests are staged, and in the spring and early summer evenings may be heard open air concerts by the best college band in the United States.

Nature has been very kind to Decorah. Surrounded by hills that, in the eyes of dwellers on the prairies, seem almost like mountains, the city lies in a bowl through which winds the river. In this mirror is reflected the foliage of the hills. Rising almost from the water's edge high bluffs with outcroppings of Trenton limestone greet the eye. In one of these, just north of the business portion of the city, is located

one of nature's natural refrigerators—a cave where ice forms during the heat of summer, only to disappear as winter comes on.

The Decorah ice cave is really one of the scientific wonders of the world. Theories have been advanced by a number of scientists as to the formation of ice in it, but at best they are only theories and must be accepted as such. The only explanation that the layman can offer is that it is nature's refrigerator, the ice being formed by air currents passing through the chambers of the cave and out through a small aperture in the top of the bluff above the cave. The quantity of ice seems regulated by the amount of moisture in the ground. In seasons of excessive moisture ice will form to a thickness of six inches on the walls of the cave, but in seasons of drouth the quantity is small, sometimes disappearing altogether, though the cave will be damp and very cold. The only other ice caves of importance known to the scientific world are located in Kentucky and Russia.

An ice well also exists in Decorah; it is located on a hillside in the south part of the city, a mile or more from the ice cave. It has been known to freeze over during the month of May.

A scenic road has been built that passes this cave, and near its western terminus the visitor comes upon a sequestered nook in a valley where Dunning's spring gushes from the rocks and tumbles down the hillside for a distance of sixty feet or more in its haste to swell the waters of the Upper Iowa. The courage to scale the heights above this spring will be rewarded by a view of ravishing beauty. In the foreground the habiliments of a clean, prosperous city glint in the sunshine, while across the highlands may be seen the comfortable homes of thrifty farmers, and the spires of churches where they gather religiously to acknowledge the boons that a kind providence has bestowed upon them.

Passing out through west Decorah, Pulpit Rock comes into view. At a point where the road turns the elbow of a hill there rises a pillar of stone that reminds one of the high pulpits of olden times. Following the road a little farther the tourist comes upon a stream that, when pursued to its source, is found to be fed by two springs. It is the natural home of the trout and many a speckled beauty has been lured from its hiding place under the banks, but lest the reader may be making plans for a raid upon it, let me say that the Decorah Rod and Gun club has caused the stream to be posted and no fishing is allowed at present. Beautiful pines and hardwood trees line the hills here. In the spring anemones, hepaticas and blood roots, dog toothed violets, trilliums and Dutchman's breeches, followed later by purple violets, bloom in profusion, while nodding in the breeze near by are stately ferns and the finer maiden hair awaiting to take their place in the bouquet.

Retracing our steps we swing to the right and soon are passing over the Dug Way. Through a fringe of trees the water of the river sparkles only a few feet away, but rising over one's head is another of those limestone bluffs, pierced by ravines that issue a silent invitation to him who would explore.

It is above this bluff that is located one of the most inviting spots to be found in the whole state of Iowa—the city park. For years this wooded tract was a favorite playground of the youth of the town. Some years the people gathered under its inviting shade for Memorial day or Fourth of July exercises, and picnics were frequently held here. Not until it threatened to be sold and used for farming operations were the people aroused to the real beauty of the spot. Several years previous it had been offered to the city for park purposes at a modest sum, but at that time no one seemed interested. Even when the danger of losing it permanently became real, only prompt action saved it to the city. Under the direction of a duly constituted park commission drives have been laid out, pavilions, look-outs and structures of stone in ornamental design erected, and playground fixtures installed for the entertainment of children. Tables for picnics are placed here and there, and during the summer band concerts are given on Sunday afternoons and evenings. The fame of the park has traveled far. No attempt has been made to beautify it in the way that is frequently employed in larger cities—this has not been necessary because nature has provided for that, leaving for man comparatively minor details. People come long distances to spend the day here, and on Sundays and holidays one is sure to find cities 50 to 100 miles distant represented in the throngs. The views up and down the river from the park have often been compared to those of greater fame in foreign lands.

Nature has not been alone in making Decorah a place worth visiting. Her citizens realize the worth and pleasure of inviting surroundings and have built homes that compare favorably with those of larger cities. Her business streets are paved and the thoroughfares throughout the residence districts are well kept. The enterprise of the community is further reflected by public buildings of substantial and beautiful proportions. Among these are the Grand Opera house, Winneshiek hotel and the Decorah hospital, all built by private subscription. A courthouse costing \$200,000 stands on an eminence in the center of the city and is flanked on one side by the government postoffice, built at an expense of \$65,000 while on two other sides are four of the leading churches.

Decorah has long been known as an educational center. In addition to Luther college there are excellent public schools, and Valder college where commercial and normal training are featured. Printing is one of the chief industries. There are three English newspapers, the largest weekly Norwegian newspaper in America, and the publishing house of the Norwegian Lutheran church. Four banks with combined resources of over \$3,000,000 testify to the financial stability of the community. The city owns a splendid water system. Two wells supply water that passes the severest test for purity. Last year a complete sewer system costing nearly \$200,000 was installed. Gas and electric franchises are owned by private corporations. Decorah is the business center for the Interstate Power company, operating plants in Decorah, Waukon, Cresco, Postville and Lansing, and owning two dams on the Upper Iowa river that rank second in power development in Iowa to the big dam at Keokuk.

Decorah is at the terminus of the Decorah division of the Rock Island railroad, and is also served by the Milwaukee road, connection with the main lines being made at Calmar, twelve miles distant. It is also on the Imperial and Burlington highways.

As I approach the close of this article I realize that I have drifted somewhat from the original purpose of telling why Decorah is one of the places that lovers of nature at her best should visit, but when a man has lived all his life amid such surroundings, growing up with its citizens and knowing all that they have endeavored to accomplish, it is but natural to wish to give them credit for their part in making this one of Iowa's worth while cities.

Come and visit us. The latch-string is always within reach and will lead to a cordial welcome.—Iowa Magazine, April, 1918.

THE DECORAH ICE CAVE.

By B. W. Hoadley.

The Decorah ice cave, located in the face of the bluff, on the north side of the river opposite Decorah, is the most interesting of the many caverns which the Galena limestone contains. The walls of this cave, dry and bare in the autumn and early winter, are coated, during the spring and early summer, with a layer of ice.

The cave is merely one opening into a vast network of fissures; penetrating the underlying rocklayers for miles around. In the fall as the air cools and contracts in volume, it enters the cave from which it emerges as a cool draught when the sun's warmth again penetrates the rock layers. At the mouth of the cave, where the expansion is the most rapid, ice forms on the north wall. The cold, then, is merely the stored up cold of the former winter.

ONEOTA RIVER AT DECORAH.

By James H. Lees, Geologist.

Decorah has splendid possibilities for park areas. The entire river valley here is beautiful and majestic in its proportions. It is carved nearly 300 feet into the solid limestone and great cliffs and towers lift their massive forms scores upon scores of feet above the placid river flowing past their feet. One of the most magnificent of these cliffs is just below the steel bridge across the river at the northeast edge of town. This cliff rises vertically to a height of over 150 feet above the water and beyond its crest the somewhat gentler slope rises another 100 feet and more. A great number of conifers crown the summit and upper part of this escarpment and stand out in bold relief from the deciduous trees amongst them.

Between the steel bridge and Mill Spring ravine, nearly a mile upstream, is a noble bluff, steep everywhere and in places precipitous or vertical. Trees cover it wherever they can obtain foothold and here and there beetling rock precipices stand out among the foliage. The spot of greatest interest in this locality is the Ice cave, which is situated perhaps midway along the bluff as well as about the center of its 250 feet of elevation. The local Commercial Club has built a road along the face of this bluff and from here a fine view may be obtained across the valley to the opposite wall, as well as up and down the river. Mill Spring, at the upper end of this drive, is an unusually large one, even for this land of abundant springs. It comes boiling and bubbling out of the rock at the base of a great cliff which springs nearly a 100 feet straight upward. Thence the stream, four or five feet wide and several inches deep, dashes down over the loose rocks, along the narrow ravine and into the river. The spring is at the mouth of a great cavern which resembles the Ice cave, but is blocked by fallen rock masses. It undoubtedly was once similar to the Ice cave in both nature and mode of origin. At the mouth of Mill Spring ravine there is a deposit of tufa which once evidently filled the mouth but has been partly cleared away. What was the origin of this peculiar deposit? It is composed of lime which was doubtless dissolved from the limestone rocks of the region and was re-deposited here, perhaps by the water of the spring at some time when it did not have free flow to the river. The lower part of the deposit shows what seem to be impressions of stems and twigs of vegetation, indicating that the lime was deposited around these plant fragments and that they have since been removed by decay.

The Ice cave and the Mill Spring cave seem to have been formed by the slipping out on their bases of great masses of rock, which were separated from the main part of the cliff by joints. Thus a triangular opening was formed between the cliff and the loosened block. Doctor Calvin has explained in his discussion of the Ice cave that the country rock of this region is thoroughly penetrated by cracks and fissures and hidden caverns. During the winter cold dry air is drawn into these open spaces and in the spring and early summer when the sun's heat is warming the outer portion of the earth's crust, this air also is warmed and expanded by which means some of it is driven out into the open. Where this cold dry air comes into contact with the quiet warm moist air of the cavern it causes precipitation of the moisture upon the inner wall, and the temperature of the outcoming air is still so low as to freeze this condensed moisture, forming a coating of ice several inches thick on the lower part of the wall. During the latter part of the summer the ice melts away and the wall remains bare until the next spring. There is also near Decorah a freezing well which has the same peculiarity as the Ice cave.

Decorah is not the only locality in the Oneota valley which can boast of beautiful scenery. Up the river there are especially noteworthy localities at Bluffton, Plymouth Rock and Florenceville, while in the lower valley, where it is deeper and the bluffs are higher, picturesque spots are plentiful. The various "Backbones" in the state which for some unaccountable reason are dedicated to the evil one may be dupli-

cated in half a dozen spots along the Oneota, and doubtless owe their existence and form to similar conditions—namely the meandering of the stream while it was still flowing up on the level of the divides and uplands. Now that the river has cut its valley 400 to 500 feet below these uplands, having made its bed, it is literally forced to lie in it. Similar cases of entrenched meanders are plentiful along Turkey river between Spillville and Clermont and on some of the smaller streams of the region.

THE SCENERY AT IOWA FALLS.

By Frank E. Foster.

You Iowans who enjoy touring around a bit in your automobiles—you who enjoy nature when she is unusual, untamed and picturesque—take out your map of Iowa and put a big blue mark—or a red mark—or some other kind of a mark—on Hardin county.

Then take out your little memoranda book and jot this down:

“Trip to Hardin county and Iowa Falls during summer of 1917. Scenery is beautiful.

“P. S. Roads in Hardin county are among the best in Iowa.”

One thing more: Promise yourself you will take this trip—and then be sure to keep your promise.

When one thinks of touring in Iowa, one's mind pictures endless rolling prairie, limitless fields of corn, and a great multitude of obese cattle and snub-nosed hogs. Add rotund farmers, bulging pocket-books and mud-roads—and you have the composite average conception of the grand and glorious state of Iowa. At least, that always has been the idea; but Iowans are beginning to get interested in their state, geographically—and to know it better. There is real beauty in Iowa, and if you keep that promise to visit Iowa Falls this summer, you will be delightfully surprised. No other city or town of the Hawkeye state can duplicate the beautiful setting that nature has given to Iowa Falls.

Viewing the environments of this city, one is impressed with the fact that nature, fickle and of many moods, paused here to paint romantic pictures that will forever distinguish it. Nature has done so much for Iowa Falls, there is little left for her citizens to do in the way of adornment, and so they are content to preserve, conserve and appreciate these beauties.

Save in the rugged and scenic spots of northeastern Iowa, there is not found in the Hawkeye state scenery like that which abounds in and about Iowa Falls. Rising in Crystal Lake of Hancock county, the Iowa river flows peacefully through a prairie country until it reaches the western limits of Iowa Falls, where it dashes into a chasm in the rocks and for two miles or more flows between massive stone walls that the erosion of ages has cut. On both sides of this chasm, the people of Iowa Falls have builded well, and there is not a person within her confines who does not revel in the beauties here so lavishly bestowed.

To add to the beauty of the river itself, are several tributaries that have cut a way for themselves through the rocks of the ages. And so it is that Wildcat Glen, Elk Run and Rock Run have each a beauty of their own that attracts and holds the eye of visitor or resident. One feels his inability to describe the many beautiful spots; sight alone can convey to the stranger the correct idea of Iowa Falls.

To bring this natural beauty closer to the public, the citizens of Iowa Falls have preserved it in the way of parks, drives and bypaths that offer opportunity for a communion with nature in many of her moods. Wildcat Glen has been given to the city by Mrs. A. J. Foster as a part of the park system, while Jones park, given to the city by the late L. E. Jones, gives the city control of Rock Run. River Drive affords opportunity to view the lower river, while Riverside Drive running west of town takes one along the upper river, with beauties all its own. This latter route forms part of the "Around the Loop" drive, which is popular with everyone and gives a glimpse of Siloam Springs, a resort west of the city that is the mecca of autoists within a radius of thirty miles of Iowa Falls.

The river attracts many during the summer months with its delightful boating amid romantic surroundings. Combined with this recreation, one is offered bathing facilities and good fishing. The river at this point has been stocked nearly every year either by the federal government or by the state, and with good protection it is fast becoming a favorite spot for the disciples of Isaac Walton.

Many delightful hikes appeal to the lovers of the great outdoors.

Possibly no more exhilarating sport is offered any place in Iowa than the famous canoe trip down the Iowa river from Alden to Iowa Falls, and if one wishes a longer trip, then on to Eldora. Particularly exciting is the dash down the rapids that marks the course of the river for a distance of over seven miles between Alden and Iowa Falls. When the stage of the water is good, the lovers of this sport ship canoes to Alden by rail and then, pushing off in the stream, commence an exciting trip that must be taken to be appreciated. Whirled past beautiful pastoral scenes and through canyons cut in the solid rock, every minute is fraught with enjoyment and just enough of that risk of the hazardous to add zest to the journey. Shooting the rapids, one drifts out upon placid water that for a short distance flows with a gentle current, and the next moment turns the nose of the canoe into the churning waters of the rapids.

Just outside of the city is found Siloam Springs, where man has added to the beauty of nature and provided a place that affords rest and recreation far from the heat and turmoil of the city life. The springs themselves produce water the equal of any of the famous springs. Some day it will be utilized as a table water by some one enterprising enough to put it properly before the public. Surrounding the springs are beautiful shady nooks, while for those who love to dance, a commodious pavilion has been provided.

With her four transcontinental and interstate auto routes, more and more people are brought here each year. It is a delightful stopping place for tourists, for here is a resting place so different that it is a

delight to those who tarry long enough to view the natural setting of the city. Located on the Hawkeye highway, the Diagonal trail, the Jefferson highway and Inter-State trail, Iowa Falls is fortunate in offering facilities for auto travel, while its four railroads radiate in as many directions, making the city one of the most accessible in the state.

If you ever tire of the beauties of the Iowa prairies, of which many a poet has sung, and long for a glimpse of rocks and glens and romantic spots that will stir the muse to expression, just pause long enough in Iowa Falls to view her beauties and refresh yourself with the hospitality always found within her gates.

GEOLOGY OF HARDIN COUNTY.

By Samuel W. Beyer, Geologist.

The Iowa river has its source in the lakes and ponds of Hancock county, enters Hardin county near the middle line of Alden township and takes a most sinuous southeasterly course across the county, entering Marshall about two miles west of the east line of Hardin county. Below its junction with South Fork, the Iowa flows through a broad terraced valley, varying from three-fourths to one and one-half miles in width, and has a flood plain averaging a half mile in width. The gravel terrace measures twenty feet above the flood plain at Gifford, ten feet at Union, and is scarcely recognizable beyond the Marshall county line. The Iowa Central is built on this terrace.

The stream meanders greatly over this broad alluvial flat. Indurated rocks appear in places in the stream channel below the mill at Union, and support the flood plain, rising above low water level, between Union and Gifford. These facts would indicate that this portion of the stream was extremely old. While it had apparently reached a base level sometime since, it has done but little filling and at present is deepening its channel slightly between Gifford and Union. North of the junction there is a decided change in the landscape. The valley contracts sharply and the flood plain is too narrow to be represented on a map of the scale used in these reports. In this portion of its course almost no alluvium has been deposited. The stream flows over bed rock through a gorge whose walls are rock supported. The convex sides of the bends are often marked by mural escarpments of red sandstone varying from forty to sixty feet in height, crowned by drift bluffs which rise more than 125 feet above low water level. Beyond Steamboat Rock the sandstone lodges are obscured by drift talus but the restraining bluffs lose none of their precipitousness and range even higher than along the lower course, attaining a height of at least 150 feet above the present channel, between Steamboat Rock and Hardin City, and again between Hardin City and Eagle City. These eminences are largely composed of glacial debris. An impure limestone at the base of the bluff, near the Jackson-Clay township line on the south side of the great bend at Hardin City, forms a shattered ledge some eight to ten feet above the level of the

water in the river. The extremely circuitous meanders in the vicinity of Eagle City and Hardin City marks the Altamont moraine crossing. The Gifford terrace is easily traceable to Hardin City, where it has an elevation of thirty-five feet above the flood plain. At Steamboat Rock where it reaches its maximum it is sixty-five feet above the flood plain. The constituent gravels are much coarser at both of these points than at Gifford and Union. At least two other terraces may be noted above this and the stream is engaged at present in cutting one below. At Hardin City the upper terraces are forty-five and seventy-feet, and at Steamboat Rock ninety-five and 110 feet, above low water in the river. Iowan boulders were noted in abundance on the ninety-five foot bench. Northeast of Eldora the gravel bench, which rises about seventy-five feet above the river, is probably the continuation of the second terrace at Steamboat Rock. The materials are much finer and stratification planes, though much interrupted, are very prominent. Fragments of these terraces may be viewed at other points. The terrace now forming is already out of reach of high water. It varies from fifteen to twenty feet above low water level. The Iowa Central railway is built on it between Steamboat Rock and the point where the railway leaves the river valley north of Eldora. This terrace is also sought out by the C., I. & D. railway for a mile or two either side of Xenia. In the latter region the bench is in part rock supported. Below Union the Gifford terrace merges with the one now forming and thus continues into Marshall county.

Beyond Hardin City there is a marked change in the topographic features; the bluffs recede from the river, and the contours are markedly softened. The gravel terraces which characterize the valley cross-section in its lower course become less prominent and beyond Eagle City practically disappear. The Eldora sandstone, underlain with shales which engender a bold relief, has given place to the limestone of the lower carboniferous. The change in indurated rocks is clearly recorded in the landscape. At Eagle City the river has made an incision into the limestone of some forty feet. This state of affairs, although more or less obscured by drift talus, persists to the vicinity of Iowa Falls. Here the stream flows through a limestone gorge which attains a maximum depth of seventy feet at the Iowa Central railway bridge. The retreating drift bluffs rise some fifty feet higher. At this point the stream has been displaced in very recent times. There is a well marked channel south of the Bliss annex, now sought out by the C., I. & D. railway. This depression closely parallels the present channel to the eastward, and also toward Alden. The so-called "Rapids of the Iowa," or "Iowa Falls," from which the town is named, the canyon-like gorge of the river itself, and its inlets, Rock Run, Wild Cat Glen and Elk Run, all owe their origin to this displacement. In fact the accidental blocking of the old channel by the ice, which necessitated the cutting of a new one, has given the surface a picturesque ruggedness which renders Iowa Falls unique among interior Iowa towns; and for natural beauty it is without a peer. Westward the stream walls are less gorge-like. Low rock walls appear almost constantly on one or both sides of the stream as far as Alden. North of Alden the indurated rocks disappear, the bluffs become more subdued and the stream, soon after passing over into Franklin county, takes on the character of a

drift prairie stream. Briefly told the Iowa flows through a more or less close walled gorge from Alden to near its junction with South Fork, where it suddenly emerges into a broad valley with a well developed flood plain, and is terraced from Eagle City to the Marshall county line. Its minor tributaries partake of the characters of the parent stream, with this exception, that those from the east have well developed flood plains, relatively low gradients and other characters common to maturely developed streams. It may be of interest to mention that above the forks the Iowa river does not receive a single tributary from the west worthy of a name. The area drained is inconsiderable, drawing almost no tribute save from the north and east.—Iowa Geological Survey, Vol. X, Annual Report 1899, p. 251.

FOREST FLORA OF HARDIN COUNTY.

By L. H. Pammel, Botanist.

One of the interesting phases of botany is a study of plants with reference of their adaptation. Plants of widely different relationship are frequently associated in communities. Such plants show the same adaptations as regards their structures and growth.

Certain physiographic features of the country have a marked influence on the plant communities. Sandy, moist rocks support a very different class of plants than limestone rocks, or the alluvial bottoms of the streams. These features often determine the geographic limitations of some trees. The white pine (*Pinus strobus*) is a very local tree in this state, being confined to the sandstone ledges of eastern and central Iowa. The white pine is not, however, found in this state wherever the sandstone ledges occur. Extensive carboniferous sandstone deposits occur along the Des Moines from Moingona south, and while the forest growth at various points is somewhat similar to that of Hardin county, three of the prevailing species do not occur, namely, white pine (*Pinus strobus*) and two birches, the white birch (*Betula papyrifera*), and the cherry birch (*B. lutea*). Botanists have long recognized that species tend to move northward or southward, and less frequently plants move eastward and westward. The westward extension of the eastern trees in Iowa is marked by certain valleys. Taking the white pine as an illustration its western limits is marked by the Iowa valley. Dr. S. W. Beyer calls my attention to the report of David Dale Owen,* in which he refers to the occurrence of white pine on the summits of the hills along the Iowa river in Hardin county. Its southern extension is Pine creek in Muscatine county. The Davenport locality, Reppert Watson and Coulter Gray's Manual (6th Ed.) 490, is clearly an error, as I have shown elsewhere. The paper birch, (*Betula papyrifera*), has its western limit in the same valley, and is clearly more local than the white pine. Macbride reports as follows: "Occurs in cultivation, and is reported abundant along the Boone river east. Perhaps comes within the limits of the county in the northeast corner." Its occurrence there would be extremely interesting.

since to my knowledge the species does not occur in the vicinity of Webster City along the Boone river. The occurrence of the cherry birch in the vicinity of Steamboat Rock is another equally interesting discovery. So far as I know this is one of the few recorded localities in the state. The cherry birch is a distinctly northern tree, found in moist, sandy, rocky soil in western Wisconsin. The white birch occurs in the more exposed and drier places, conforming to its habitat, in western Wisconsin and northeastern Iowa, as I indicated in a paper in *Garden and Forest* on the forest vegetation of the Upper Mississippi. MacBride*, in his paper on the forest trees of Allamakee county, says: "Certainly confined to the northeast corner of the state."

Until finding the species last fall I had not known of its occurrence in Iowa except in the counties north of Dubuque along the Mississippi river.

The flora of this region is a typical northern or, more properly, the transition of C. Hart Merriam.*

The arboreal vegetation is accompanied by many typical northern species. It has many more northern species than Clinton or Dubuque counties and but few of their southern species. Papaw (*Asimina triloba*), pignut (*Carya olivaeformis*), *Cercis canadensis*, and *Q. acuminata* occur at Clinton but are entirely wanting near Steamboat Rock. The typical transition species occur for some four or five miles north of Steamboat Rock but disappear south. These are practically confined to the sandstone ledges. Beyond these ledges the timber presents nothing unusual for central Iowa.

This small area is well watered and where it was not pastured it was decidedly swampy, as evidenced by the profuse growth of jewel weed (*Impatiens fulva*), and greater lobelia (*Lobelia syphilitica*). The showy lady slipper (*Cypripedium spectabile*) was less common in open places. In the densely shaded woods the ground was covered with a species of hypnum. Ferns (*Phegopteris dryopteris*, *P. polypodioides*, *Asplenium felix-foemina*, *Polypodium vulgare* and *Aspidium marginale*). The latter to my knowledge has not been recorded for the state, and certainly is much beyond the usual range given to it. In Wildcat Den, Muscatine county, where the physical conditions are somewhat similar, it is entirely absent. The two species of ferns (*Phegopteris*) have been reported from other sections of the state. All of these are northern species. The small bush honeysuckle (*Diervilla trifida*) has a range from Newfoundland to mountains of North Carolina west to Minnesota. Reppert also reports it from Muscatine county. It is, therefore, much beyond its usually given range. The silky cornel, (*Cornus circinata*) is a common shrub on sandy rocks in western Wisconsin, its natural range being from Nova Scotia to Dakota, south to Virginia and Missouri. Its Missouri occurrence is like the Iowa, usually in isolated places. Reppert records it from Muscatine county along Sweetland creek and I have observed it as a rare shrub at the ledges in Boone county. The dogwood (*Cornus asperifolia*) is more common. The sandy piny woods are covered with oat grass (*Danthonia spicata*), which is true also of the woods along Pine creek in Muscatine county and the carboniferous sandstone ledges in Boone county.

*Year Book U. S. Dept. of Agri., 1894, p. 209.

The timber along the Iowa river in former days was much used for railroad ties; the best has, however, long since been removed. There is, however, still some merchantable timber which is being cut into lumber, and much is used for fuel. Of the gray or cherry birch (*Betula lutea*) there were trees twelve inches in diameter which might very profitably be used for lumber.

The forests have been much injured; there is, in fact, general complaint that the forests do not do as well as formerly. Several causes have led to this. The unseasonable winter of 1898-1899 killed many trees or injured them so severely that they will never recover, and should at once be cut out. Trees varying from saplings to those one and a half and two feet were destroyed by this freeze. Some of these trees have attained an age of fifty to seventy-five years. Is it possible that during all these years Iowa has not experienced such a winter? Where there are solid bodies of large trees still standing it is reasonable to suppose that the conditions during the past season were unusual, or man has so modified present conditions that trees have been unable to resist unseasonable climatic conditions. In going through these forests one cannot help but notice that man is responsible. I passed through acres of timber in which the ground had scarcely a weed growing—the ground was bare. It had been stocked to such an extent that there was no longer any covering or protection to the roots. The farmer in Hardin county and elsewhere in the state, is attempting to grow two crops on the same ground at the same time. It is evident that unless the farmers adopt a different system of treating the forest they must, sooner or later, lose what little timber is remaining. There are many points along the Iowa river, in Hardin County, that can never be utilized for farming purposes, which should be devoted to forestry.—Iowa Geological Survey, Annual Report, 1899, Vol. X, p. 306, with some additions.

TOPOGRAPHY OF BOONE COUNTY.

By L. H. Pammel, Botanist.

The topography of Boone county has the character of a drift plain. It is flat, except near the streams. The Des Moines, which is the principal river, enters the county in Pilot Mound township and flows in a southerly direction, dividing the county into two parts. The Des Moines valley is narrow, with numerous small tributaries, also narrow, often with gorges. The most important of these are found in the vicinity of Moingona, commonly called the Ledges.

The streams are Bear, Pease, Eversole, Caton, Elk and Bluff Creeks. The terraces along the Des Moines river, and other streams, show the recent development of these streams. Squaw Creek, a tributary to the Skunk river, drains the northeastern part of the county.

REINDEER LICHENS AT THE LEDGES.

By L. H. Pammel, Botanist.

To the students of botany, geology and zoology, at the Iowa State College, the Ledges have become famous for rare, interesting and unique plants found in the region, as well as its interest from the standpoint of geology, zoology and Mound Builders. It may not be generally known but it is one of the few places in Iowa where the Reindeer lichens occur which cover such immense areas in the Arctic regions.

THE LEDGES, NATURE'S GIFT TO IOWA.

By Carl F. Henning, Author.

Throughout the length and breadth of our land there is today an awakened interest in the Great Out of Doors. The public conscience has been quickened, and the attempt to preserve and restore some of the wild life is no longer looked upon as a fad or idle sentiment.

A halt has been called on the wanton waste of the forests, and more than a million acres of public forest lands have been reserved by law for posterity. In these great national forests the harmless wild creatures will replenish if they are given the opportunity. The plan of Senator Kenyon to set aside a tract of land in the northeastern part of the state is receiving the hearty approval and endorsement of the people of Iowa and neighboring states.

The traveler who passes through Iowa, along our splendid highways, speaks in words of admiration of the pleasing scenery, the pretty birds and sweet scented flowers. We ourselves are beginning to realize that there are many beautiful places and a wealth of material within the borders of our state suitable for parks and wild-animal preserve. These beauty spots of Iowa were made for our present enjoyment and for those to come. They should be set aside by the state and preserved for future generations as places of rest and recreation.

In Boone county nature has provided a natural park, known as The Ledges, the most picturesque spot in central Iowa. I hope that this piece of woodland with its beautiful scenery, noble trees and running streams will some day become a state park and wild animal refuge. Here the elk and deer could roam and rear their young as in the early days of Iowa. To write about The Ledges and its natural beauty, to the end that it may be preserved for the people of Iowa for a park is a subject broad yet inviting, the duty is a pleasant one, for I have enjoyed these many years the benefits of this beautiful piece of woodland. To spend a day or an hour at the "Ledges" is a pleasure and leaves sweet memories—but to visit this restful place with the coming and going of the seasons, in sunshine and storm, to learn its secrets and find its hidden treasures, is to love them as you would your dearest friend.

"Through the woodland, through the meadow,
As in silence oft I walk,
Softly whispering on the breezes,
Seems to come the red man's talk."

The artist who would attempt to present with the brush the granduer of The Ledges would find the task to lie beyond the grasp of his endowments. So the pen is inadequate to present to the people of Iowa in its reality this realm of natural beauty. Prof. L. H. Pammel, of Ames, Ia., in his article on the conservation of the wild flowers, wherein he mentions The Ledges, says:

"Let us now and then muse in the woods and enjoy the beautiful around us. It will make better men and women. Everyone recalls with pleasurable delight, the swamp on the farm when the marsh marigold lifted its golden yellow flowers in the sun, or the sunny and gravelly knoll on some farm in northern Iowa, where the pasque flower in purple clusters strongly defied the elements of weather. Perhaps you remember the long tramp in the woods in May when suddenly you found a few yellow lady slippers, under some tree, or perhaps you remember the day in June when you went over a mossy bank, and you came across the large white royal lady slipper, or you found one of the real orchids with its roots tucked away in the moss. The lady slippers and orchids never were common in Iowa hence the greater delight in finding them.

"You also recall that in the early days you went into the woods and here you found an array of early blooming plants like the dutchman's breeches, hepatica, bloodroot, bell-flower, may apple, rue anemone, etc. Now go back to some woods after a lapse of twenty-five years and you find that these plants have totally disappeared or are becoming rare. The disappearance of plants in some parts of Iowa may best be illustrated by calling attention to a few places and what has occurred in twenty-six years. Let me select the place known as the "Ledges" in Boone county. The most interesting spot in central Iowa, about five miles from Boone and on the Des Moines river, is unique among Iowa's beauty spots. It is a most picturesque place.

"A small creek runs through the ledges known as Peese creek. The sandstone ledges in some places are about seventy-five feet high and with a gentle slope extending to the top of the prairies of about 125 feet more. The sandstone rock consists of a deposit of rather coarse sand with a considerable amount of lime. When I went there twenty-six years ago the small valley was heavily timbered, the most important trees were the corky bark elm, black maple, black walnut, slippery elm, basswood, and swamp ash. In the spring the wake robin occurred in large numbers in the humus. The moosewood, red cedar, buckthorn, pin cherry, ninebark, and dogwood were rather common over the hills or on the ledges.

"Today, however, these plants have become greatly diminished. The pin cherry only occurs in one place and comparatively few of the trees are left. The ninebark too has been reduced to a few plants on the edge of an almost inaccessible ledge. The buckthorn and moosewood have not been found recently. Only two or three red cedars are left—though at one time fairly common.

"It was not difficult in those days to find a few specimens every year of the yellow lady slipper; now, however, this plant is rarely brought to us. Down in the valley the ground was covered with the may apple, the indian turnip, and the dragon's head. These plants though still occurring are rare.

"There were also a great many sweet williams and wild cranesbill. The Ledges are unique for central Iowa because of the occurrence of several interesting ferns, among them the walking fern, the common polypody, the *Asplenium filixfoemina*, *Adiantum pedatum*, *Woodsia obtusa*, and *Systopteris fragilis*. These ferns except the last are all protected because they occur in inaccessible ledges. The latter fern is common in the woods. The reindeer lichen occurs on an exposed point. It is the only locality so far as I know in the state.

"The region is now subject to pasturage and the valley is used as a camping place. The people who use it totally disregard the rare plants found there. Generally these plants mean no more than weeds."

May the time be near at hand when the state will own The Ledges. Under our guardianship the ruthless destruction of trees, shrubs and flowers, as mentioned by Prof. Pammel will not be tolerated. In Europe the tree is protected with legislation befitting its importance as a national asset. Its slow growth, covering a period of generations, gives it a value not to be regarded lightly or within the control of its temporary owner.

That which nature builds up by the slow accretion of centuries should not be destroyed by the whim of one generation of men. There is nothing in vegetable nature so grand as a tree—grappling with its roots the granite foundations of everlasting hills, it reaches its sturdy and gnarled trunk on high, spreads its branches to the heavens, casts its shadow on the sward; and the birds build their nests and sing amidst its unbrageous branches.

The following reference to The Ledges is made in the Iowa Geological Report, Vol. V., page 187: "In the south central part of the county, the older carboniferous formations have been cut out and replaced by a younger massive sandstone. A casual observer traversing the river valley cannot but notice the sudden change in topographic form, when this sandstone is reached. The rounded salients of the coal measure shales and argillaceous sandstones, give place to mural escarpments and bold buttresses of the "Ledge" sandstone, amply testifying to the change in stratigraphy. This terrain is typically exposed near the mouth of Peese creek, a tributary of the Des Moines entering from the east. The creek valley is extremely narrow and walled in by vertical cliffs, often overhanging ledges; hence the name of the formation.

"Examples of water sculpture are numerous and beautiful. The ridges and less precipitous slopes support a luxuriant vegetation. In short, the inorganic and organic worlds have conspired to make this one of the most picturesque spots in the region. This formation presents many interesting lithological variations, the manifestation of which, in all probability is due to, or at least has been accentuated by, the weathering processes. The second member contains numerous ferruginous concretions varying in size from a few inches to many feet in the direction of their greater dimension. Others take an almost quartzitic facies, and are so hard that they will strike fire with steel. These nodules are commonly lens-shaped or spherical, but in some instances are cylindrical.

"By reason of their relatively greater refractoriness, they often project beyond the softer matrices, and closely simulate the trunks of trees, and they are currently known as such. To make the delusion more complete the pressed cylinders weather concentrically and have a striking resemblance to the truncated bodies of exogenous trees of gigantic proportions. The lower bed of the section shows in many places cross-bedding, the appearance of which is intensified by the differential corrasive and corrosive effects of the present stream. The sandstone is known to have a thickness of upwards of one hundred feet and has been represented in the section as occurring in three stages. The divisions are arbitrary rather than real; the external differences being due to accidents of weathering rather than to variable conditions during sedimentation.

"The ledge sandstones may be considered as a geological unit representing a period of continuous deposition. As in most deposits of its kind it is of limited extent. It thins out rapidly both to the north and south. At Bear creek half a mile down the river it is reduced to forty feet, and two miles in either direction from its typical exposure it entirely loses its identity, giving place to alternating sands and shales. One mile and a half toward the source of Peese creek the older measures pass unconformably under the ledge sandstone. Approaching from the south about one mile below the mouth of the Bear, two seams of coal are easily seen outcropping along the river bank, the lower being twenty feet above the water.

"Where first observed these coal beds are separated by a considerable thickness of shale and clay. Proceeding northward the intervening strata gradually disappear, and before reaching the mouth of the creek the veins themselves end abruptly, and the ledge sandstone comes into view. Both stratigraphically and lithologically the ledge sandstone seems to have its homologue in the massive sandstone exposed in Marion county and currently known as the Redrock sandstone."

The Redrock sandstone is indicative of a considerable oscillation of the shore line during carboniferous times, by which the land in that vicinity was elevated, profoundly eroded and then submerged by the gradual tilting of the surface on an axis more or less parallel to the shore line. This was a period of vigorous erosion on land and of rapid sedimentation in the area in question. The ledge sandstone was laid down during this time and was followed by re-elevation.

To those who have the "wanderlust" a day spent at the Ledges Park will satisfy the "call of the wild" that comes to us all at times. To the writer The Ledges are Nature's Book of Knowledge—my friends, the birds, are always here to welcome me and it seems that their song sounds sweeter there than anywhere else in Iowa.

The study of bird life is at all times an interesting theme and many a pleasant hour may be spent in woods and fields observing our feathered friends in their native haunts. For upwards of twenty-five years the writer has taken an interest in our birds and studied their life histories—simply for love of the work. Happy hours have been spent in the fields and woods greeting our sojourners from the sunny south and taking notes on their everyday life—their song, their nesting and food habits, field notes that are full of the sunshine of summer days, the singing of birds.

the gayety of butterflies, sweet scented blossoms, the aroma of the woods, and the splash and sparkle of waters. Come with me lovers of nature and let us take a ramble to the "Ledges." The walk will do us good; "the air is balmy with the breath of the south wind and the smell of the new earth," that in itself is satisfaction. The snow may still linger in places along the old hedge fence and perhaps we will find the ground covered here and there with ice-crusts on the shady sides of the ravines along the river bottom, but this is the very place where the pheasant will build its nest in May. Let us wander along yonder small streams, Peese creek that winds its way through The Ledges valley until it reaches the Des Moines river. Here is a woodland path that we can use—it is nature's highway. Every summer happy bare-footed children have trusted to the path's guidance through the forest, as they searched for flowers and berries. If we would come here some morning at the break of day we would see the woodman's little herd of cattle slowly walking along this same path on their way to their feeding grounds, the tinkling of the cow-bell faintly echoing through the stillness of the early morn adding poetry to their leisurely movements.

Grazing and resting during the day, they return home at sunset when the thrush sings his sweet evening hymn and the whippoorwill's notes ring through the darkening woods. There is a fascination in the woods on a March day that increases as spring advances, each day nature appears in a different mood. Characteristic of these early days of reviewing nature is the sonorous drumming of the small woodpeckers on some dry and resonant limb, a distinctly musical performance. It is usually the downy woodpecker, but as Mr. Burroughs says, "He is not rapping at the door of a grub; he is rapping at the door of spring." Foot-paths are the natural avenues for nature study. Someone has said that "Those only know a country who are acquainted with its foot-paths, by the roads, indeed the outside may be seen but the foot-paths go through the heart of the land." There are many foot-paths in The Ledges. Two of these paths are mostly used by pleasure seekers. One leads to the top of "table rock," the highest elevation in The Ledges valley—from this point of vantage a splendid view may be had of the surrounding landscape.

The other path leads to the Devil's Cave. The less frequented foot-paths are to be preferred for nature study. We are most apt to meet frolicsome squirrels and happy birds where people do not intrude.

October is one of the finest months of the year. The daily glories of sunrise are repeated at evening in the sunset glow.

October frosts have chilled the air,
And turned the leaves to gold and red.

It is during these Indian summer days, when all about the hills are crowned with woods that seem to burn and glow, that we gather the golden rod along the roadsides and meet pretty red-poll linnets, goldfinch, snowbirds and sparrows. Wandering bands of roaming Bohemian wax wings pass through The Ledges valley.

We listen to the warbling bluebirds in yonder group of sumac with its crimson leaves, and watch the little boys as they climb over the old ivy-covered rail-fence with a bulky sack of nuts on their back. What thoughts

of happy boyhood days, singing birds, scampering squirrels and stained fingers those children and their sacks of walnuts bring to our minds.

It is many years since these little gatherers of nature's treasures have passed down the dusty highway. The incident is now only a memory. But may we not profit by the thoughtfulness and industry of these little gleaners? Wise lads, those happy boys—they know from experience that the hickory, butternut or walnut would not always be there for them to gather. Perhaps the little urchins learned the lesson from the squirrels.

Citizens of Iowa, let us show the same forethought and ambition, and gather for ourselves and posterity the greater treasure that lies in the very center of our state—namely, The Ledges. They are nature's greatest gift to the people of Iowa.—The Iowa Magazine, February, 1918.

FOREST TREES AND SHRUBS IN BOONE COUNTY.

By L. H. Pammel, Botanist.

Central Iowa is not covered extensively with forest growth, and Boone county forms no exception to the rule. Its timbered area is, however, greater than that along the Skunk river in Story county, but fourteen miles distant. The timbered portion of Boone county covers an area varying from three to six miles in width. It is confined to the Des Moines river and its tributaries.

Two features are especially noteworthy: first, the timbered area of the alluvial and sandy flood plain of the Des Moines river and its larger tributaries; second, the timber occupying the hilly country, which consist of numerous valleys, elevated ridges and hills. There is usually a sharp demarkation of the species of the alluvial flood plain and the hilly country.

The first area is occupied almost exclusively by the white elm (*Ulmus americana*) and the common cork elm (*U. racemosa*), soft maple (*Acer dasycarpum*), box elder (*A. negundo*), cottonwood (*Populus monilifera*), black walnut (*Juglans nigra*), willow (*Salix* sps.), and green ash (*Fraxinus viridis*, *F. sambucifolia*).

Among the hills the dominant trees are red oak (*Quercus rubra*), bur oak (*Q. macrocarpa*), white oak (*Q. alba*), chestnut oak (*Q. muhlenbergii*), green ash and white elm less common than along the river, butternut (*Juglans cinerea*), shell-bark hickory (*Carya alba*) and bitternut (*C. amara*).

On steep hillsides facing the river, ironwood (*Carpinus caroliniana*) and hop hornbeam (*Ostrya virginica*) occur. Slippery elm (*Ulmus fulva*) is abundant. In thickets, *Prunus americana*, *P. virginiana*, *Pyrus coronaria*, *Crataegus mollis*, *C. punctata*, *Cornus alternifolia* and *Viburnum pubescens* are also common to the bluffs.

Without doubt the soil bears an important relation to the kind of tree or shrub produced, and, to a certain extent, the soil and geological formation is an index to plant life. Most collectors in North America have given this subject very little attention.—Iowa Geological Survey, Vol. V, p. 232.

THE FLORA OF THE LEDGES.

By Wm. W. Diehl.

In the south-central part of Boone county is an area that possesses characteristic plants as well as peculiar geological and topographic features. This is located four miles directly south of Boone and extends for about two miles south toward and along the Des Moines river. Its name, The Ledges, is appropriate because of striking sandstone cliffs from ten to over forty feet in height, extending beyond the perpendicular in some cases as much as twelve feet. This ledge rock here comprises an island of younger massive sandstone surrounded unconformably by somewhat older carboniferous layers, which are of different structure. The conditions peculiar to this restricted locality give the flora a distinctive character.

It is evident from the appended catalogue that this area possesses a flora typical of a forested region or of a region until recently covered with woodland. Originally all or nearly all of this area was wooded. It would seem that the northern limit of the unshaded part of the map represents approximately the northern extension of the former encroaching forest belt. Along the roadside just north of this line are some remnants of such prairie grasses as *Spartina Michauxii* Hitch, which have not been found within the area in question. That the forest once extended to this line is shown by the presence of tree stumps over much of the area. The stump of a bur oak growing near a clump in this vicinity showed sixty-one annual rings. Residents of the district also attest that practically all this land was once wooded. Of course the wooded area is now confined to the rough land near the river and along the steep slopes of the ravines adjacent.

The catalogue indicates the somewhat anomalous character of the vegetation of the region. For instance, *Morus rubra* L. and *Viburnum Lentago* L., which are plentiful just outside the tract to the westward, have not yet been found within The Ledges. *Aesculus glabra* var. *arguta* (Buckley) Robinson, while plentiful at Frazer near Boone, and along Honey creek about three miles to the northwest where conditions are somewhat similar, has not been found at The Ledges. *Anemonella thalictroides* L. is abundant on the bluffs along the Skunk river in Story county, but it has not been collected at The Ledges. *Caltha palustris* L. covers the marshy southern bank of the Des Moines river to the west of The Ledges, but the writer has been unable to find it within the area in question.

The Ledges may be said to be characterized by the presence of *Cladonia sylvatica*, *Polytrichum commune*, *Camptosorus rhizophyllus*, *Polypodium vulgare*, *Woodsia obtusa*, *Trillium nivale*, *Mitella diphylla*, *Juniperus virginiana*, *Dirca palustris*, *Lathyrus ochroleucus*, *Physocarpus opulifolius*, *Prunus pennsylvanica*, and *Rhamnus lanceolata*.—Iowa Academy of Science, Vol. XXII, excerpt from the proceedings.

DESCRIPTION OF PILOT MOUND.

By Mrs. C. H. McNider.

Pilot Mound attracts an increasing number of visitors although there is no provision made for their comfort. It is not uncommon on pleasant Sunday afternoons in late summer for several different parties to motor over from here. Although the condition of the roads on the Mound makes the ascent rather difficult, anyone feels repaid for the effort, for the view from the summit is truly wonderful and the same people go again and again to enjoy it. The extent and beauty of this view has often been described and I have never seen it exaggerated.

On our last trip we found the little lake and were charmed with the beauty of its setting.

Our visits have been so brief and so late in the season that I have not had a chance to enjoy the unusual flora and bird life that Eugene Secor has told us about. You have information of these things and also of the geological interest.

If you and other members of the Conservation Board could visit Pilot Mound there is no doubt but that you would be enthusiastic about making it a state park.

A few years ago when the devastation of a portion of the Mound was threatened by the removal of the standing timber, I received the enclosed letter from Dr. Macbride which will be more welcome to you than anything I can say, for it shows how highly he regarded Pilot Mound and no one will rejoice more than Dr. Macbride over the work of saving our scenic places, which is now in progress.

LETTER TO MRS. C. H. McNIDER.

By Dr. Thomas H. Macbride, President State University of Iowa.

Now I have a problem for you! I am enclosing a clipping from the Winnebago Republican in which you will find reference to the probable fate of one of the most beautiful places in Iowa. Pilot Mound is close to Mason City; one day, if it be preserved in its beauty, the interurban from Mason City to Clear Lake will be extended to Forest City and to the top of Pilot Mound, very likely, that all men may have the delight of the glorious view from that point and may see the beautiful groves and lakes that lie up there, high above the ordinary level of the country. Is there no way now by which the people of Mason City, Clear Lake, and Forest City may unite to save, for the public and for our children, this beautiful piece of natural scenery? It will take us some time to get the state started in the direction of purchasing.

SUNSET FROM PILOT KNOB.

By Eugene Secor, Author.

I've never seen a sunset from an ocean steamer. I've never seen the great luminary dip into the Pacific from any of the high mountain peaks of the Rocky or Sierra range.

But one doesn't need to travel two thousand miles or to risk an ocean voyage to see the sky in all its evening glory and the earth in its fruitfulness at the same time. Iowa is not without its beauty spots—spots, too, where the heavens seem to meet the earth in a joint effort to magnify our inheritance.

Such a spot is Pilot Knob, four miles east of Forest City. Camp with me on its summit any time when the clouds do not curtain the sky or an Indian summer haze limit the power of our glass, preferably in early harvest. A landscape is before and behind and all around us that for extent and beauty combined is hard to match. If one is proud of teeming fields and verdant pastures and cool leafage of restful groves he may feast his eyes on a succession of such landscape views, the extent and variety of which can nowhere else be found in Iowa, although she is fair to look upon in every part of her matchless domain.

The fields of golden sheaves where the binder has hummed all day reveal the auriferous deposit left by the Wisconsin drift. Other shades of ripening grain emphasize the promise of a harvest that seldom disappoints. Haystacks in a hundred fields surrounded by a lush aftermath add refreshment to the scene. The deep green of the tasseling corn on every farm foretells another harvest of the staple that has put Iowa on the map of the world. Cattle leisurely cropping grass in another hundred fields, and patches of timber in all directions—all these present a scene of rural wealth and contentment in a panorama as the air-man sees it, but we are safe on solid ground and yet behold it.

Far in the west the sun is slowly sinking into the prairie. It is big and round and as yellow as a ripe pumpkin. The blinding light of its noonday splendor has been so softened that we watch it without blinking. Just above the descending orb an opalescent cloud is stretched across the sky, as if to catch and hold a little longer the glory of its reflected light! If an artist should paint such a picture we'd say it wasn't natural. But how could an artist overdraw such a picture as we now see? With one dash of his master brush the greater painter, the sun, has glorified all the western sky as a good-night message to a tired world just as a mother tells her little ones the most beautiful story she knows as she tucks them in for their nightly sleep.

A sunset is both a beatitude and a benediction. Blessed are they that go out of sight leaving such a halo of influence that men will stop and wonder and take courage. May all who labor and need rest go to their peaceful beds for refreshment after a day of useful toil with as much surety of rising on the morrow with renewed energy as the golden disk before us.

But turn to the east. Another candle is lit in the sky. The full moon like a great silver disk is just above the tree tops in the distance. The

world is not to be left in darkness tonight. One evening in every lunar month the full moon rises as the sun goes down. One may see both the silver and the gold at the same time—one to twenty-eight in the bi-metalism of the heavens.

On no other night for twenty-eight days may this unique sight be enjoyed—the full moon rising and the sun setting at the same time. And in no other spot in Iowa may the phenomenon be observed under such inspiring scenic surroundings.

PILOT MOUND'S BEAUTIES.

By Winifred Gilbert.

Years have been added to the multitude of buried ages since the glacial period when Iowa was a beautiful sea of ice; as this melted and vanished and spots of land became visible there was found all over the state many bluffs, valleys and lakes, but far to the north majestically and proud above all the rest, rose Pilot Mound or Knob definite, rugged and approachable, a thing of pride and a source of wonder.

Near the boundary line that separates Worth and Cerro Gordo from Winnebago and Hancock is a range of low irregular hills zigzagging their uneven prominences from the southern boundary line of Minnesota southward, near this intersection of the boundary lines of these four counties, but solely in Hancock county, about four miles from Forest City and fourteen miles from Garner the hills are more prominent.

The one that shows its bald head above all the rest is Pilot Mound, its altitude is about 1,400 feet, it is not the highest point in Iowa but it offers a wonderful panoramic view of the surrounding country, now in a high state of cultivation, happy homes, well kept farms, fine cattle, and large fine wooded timber lands, all doing homage to the mound, and makes a lover of Iowa proud of the fertile acres that stretch before him in every direction.

From the top of Pilot Knob on a clear day one can see seven railroad stations, and the winding valley of Lime creek for perhaps fifteen miles, dotted with planted groves which makes the whole country look like a wonderful garden.

The road leading up to the summit of the Mound climbs at first by easy ascent but at the top ascends abruptly and one sees the rest of the zigzagging hills covered with timber, consisting of oaks, basswood, black and choke cherry, elm, quaking aspen, black walnut, wild plum and crab, and a thick undergrowth of hazelbrush and near Forest City along Lime creek a few sugar maples are found.

About half a mile southwest of the Mound is a body of water covering about two acres, called "Dead Man's Lake," it is bordered with low timber and in the lake are three kind of lilies.

Pilot Mound in the autumn is a wonderful sight, when nature turns the sumac red and the maples try to imitate the sunset, the Virginia

Creeper looks like burnished copper, and all is glorious with color. 'Tis then Old Pilot looks like a fairyland.

FORESTRY NOTES FOR PILOT MOUND AREA.

By Dr. Thomas H. Macbride, President State University of Iowa.

The forest area in these counties was originally, and has been until recently, rather larger than usual in prairie counties. Especially is this true of Hancock and Winnebago. In the latter the greater part of the eastern townships was originally covered with forest trees and until comparatively recent years the same region has been more densely and extensively occupied by young native forest, the so-called "second-growth." The same thing was true of a large part of Forest township and of Newton township, and there was native wood about Lake Harmon, and perhaps one or two other native groves were known to the pioneer. In Hancock county Ellington township, with the southern slopes of Pilot Knob and the banks of Lime creek, were all extensively wooded country and native groves were found all along the Iowa river in Avery township and about Amsterdam. There is still a native grove at Twin lakes and one in section 11 of the township of the same name, and another at Crystal lake. The latter is now in part a park. In Kossuth county the native woods were limited pretty nearly to the valley and flood plain of the Des Moines river, particularly below the point where the tributaries, Black Cat and Plum creek, enter. The list of species represented in these native forest plantations includes the names of nearly all the arboreal forms found in eastern or especially northeastern Iowa. Along the Des Moines about Algona and along Lime creek east of Forest City and especially on Pilot Knob and on its attendant hills genuine forest conditions prevail. Undisturbed by fires the trees make luxuriant growth and add a beauty to these prairie landscapes otherwise unattainable. The presence of Pilot Knob and its wooded sides, seen like a blue wall from all the surrounding country for miles, has to this country and for it a real commercial value, and if the people who are so fortunate as to own farms and homes in the neighborhood of this piece of natural attractiveness are wise they will never suffer its beauty to be destroyed. Steps should be taken to make Pilot Knob with its woods, its lakes and its meadows, its exhilarating heights, a park to be for the delight and enjoyment of the people for all time. Algona has also great natural advantages. Her wooded banks and woodland drives along the river and across it, attended by the rich variety of native groves, are certainly surprisingly beautiful and should belong to the city, some of them at least, for the benefit of coming generations.

Tree-planting in these counties has proceeded much as elsewhere for the purposes of shelter and fuel. Every farmer has a grove, and some of these are of fine proportions and show beautiful trees. Here as in other Iowa counties the species planted have been selected as rapidly growing, rather than for value when grown. Nevertheless there are plantations sufficient to show that all sorts of trees common to our northern nurseries

may be successfully reared along these northern borders. Mr. Eugene Secor has hundreds of conifers to show how easily the farmers of this region may provide themselves with timber, even for lumber. The primeval trees in all the forests named have nearly all long since disappeared. They were the product of centuries and were ripe for the harvest. Time has not elapsed for their successors to attain much value; but there is no doubt that the most valuable hardwood trees of our northern forests will yet again find place upon the hills and by the streams of the countries to which they are native and in which history shows that they find congenial skies and soil.—Iowa Geological Survey, Vol. XIII, pp. 110-2.

PILOT KNOB SHOULD BE A PARK.

By Eugene Secor, Author.

It is quite needless for me to discuss the subject of parks as assets of a great state in the presence of those before me. The giving of your time and your money to attend this meeting indicates that you are already interested and realize the importance of securing and preserving some of the beauty spots of Iowa before they are despoiled by unthinking men.

You do not belong to that class who see nothing in a tree but cordwood, posts or lumber, and nothing in a winding bluff or quiet ravine, altho vine-clad and tree-covered and shrub-adorned, except a bit of scanty pasture.

If some people had their way there wouldn't be a thing left to remind us of our inheritance of grove and copse and wild flowers that once made Iowa charming with wild life and beauty. You realize the danger that confronts us, the tendency to sacrifice everything to the god of present gain.

I'm reminded of things I've seen in my native state. In one of my trips to the home of my boyhood I saw a rocky, steep hillside that had been recently denuded by the woodman's ax till nothing remained but bare rocks with a bit of soil between them. Ninety per cent of the so-called field was worthless for the agricultural purpose except to grow trees. Evidently there was a scant pasture for one sheep to the acre. But the piles of cordwood showed that the farmer had killed the goose that laid the golden egg.

This association was organized for the very purpose of discouraging and preventing so far as possible the desecration of God's holy places, spots that ought to be preserved in the natural beauty inherited from the glacier or from the weathering processes of by-gone ages, clothed with matchless draperies of many colors and tints before the advent of the white man with his murderous ax. The pioneer is rarely a preserver of natural beauty, he destroys. Fortunately a few things have escaped the Hunish propensity of man to destroy works of art and the artworks of God.

There are different types of natural beauty. Such is the variety in nature that there are hardly two things alike.

A jutting granite crag on the seashore, washed by the restless tides and angry waves for a thousand decades, surmounted by a lone pine that has laughed at the winds for unknown years exhibits a rugged beauty that makes one want to unharness the camera to catch this Titan watcher of the ocean's moods on the spot where he stood guard when the Pilgrims landed.

In the unglaciated area of Iowa, near McGregor, there is another type of beauty. Its high peaks overlooking the Father of Waters and portions of Wisconsin, its wooded ravines, its solemn caves and picturesque views and varying expressions of Nature's marvelous ways. That this is to be part of a national park at an early day is the prayer and the hope of all of us.

But I want to call your attention to another spot with another type of beauty, where I have wandered in times past and dreamed of a future park to be owned and controlled by the sovereign state I love so well. It is unlike any other spot in Iowa, and men of wide travel have told me that there is no finer view anywhere.

The men who made the original survey of this region for the government and who made plats and field notes for future use, called the highest peak Pilot Knob. Its altitude is only about fifteen hundred feet, and approximately three hundred feet above the valley which it overlooks. The Knob is about four miles east of Forest City, near the county line road that separates Winnebago and Hancock counties.

It is not the highest point in Iowa, perhaps, but it commands a view of the surrounding country that is nowhere surpassed.

Standing on Pilot Knob one feels that he is on the very top of Iowa, and according to geologic lore it is literally true. This pile of clay and gravel and boulders is said to be a part of the eastern moraine of the Wisconsin drift. Not that it came from the present state of Wisconsin, but it may be remembered that all this northwest country was at one time called Wisconsin territory.

Evidently the glacier that leveled the prairies of central northern Iowa came from the north. It may have brought material from Hudson's Bay. The hills of the Pilot Knob region are supposed to have been shoved laterally by the ice sheet and left in the irregular form in which we now find them. It was the last drift that overran the country we now call Iowa, and overlapped earlier and different glacial deposits.

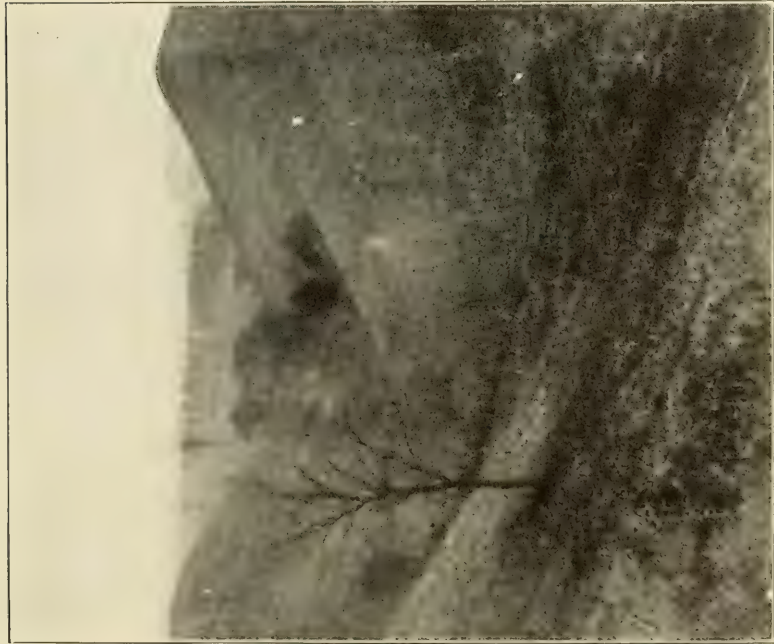
From the top of Pilot Knob a larger area of fertile land may be seen than from anywhere else on this earth, I believe. It is a panorama of wealth-producing land that makes one proud of Iowa. No matter which way one turns it is a succession of fertile farms that denote prosperity. The varying shades and colors caused by different crops and at different times of the year make the view enjoyable at all seasons. Planted or natural groves about the farmsteads, country school houses and country churches all contribute to the variety of beauty of the scene. The native growth which one overlooks in the foreground is a study in colors. Every kind of tree and bush has its individual shade of dress when in



Sioux Quartzite, Jasper Pool, Lyon County.



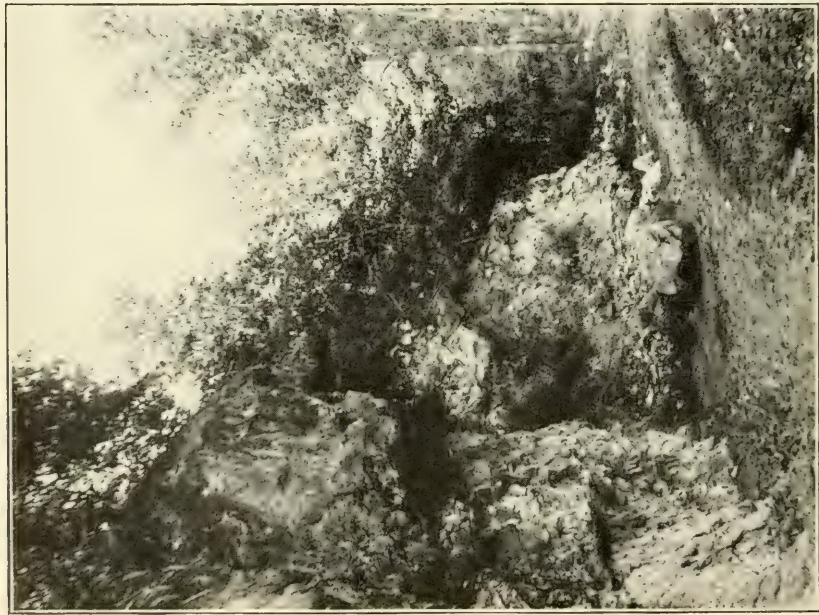
Walking Leaf Fern, Lédges, Boone.



Loess Bluffs, Near Crescent, Pottawattamie County.



Wild Iowa Crab.



Scene in Keosauqua Park.



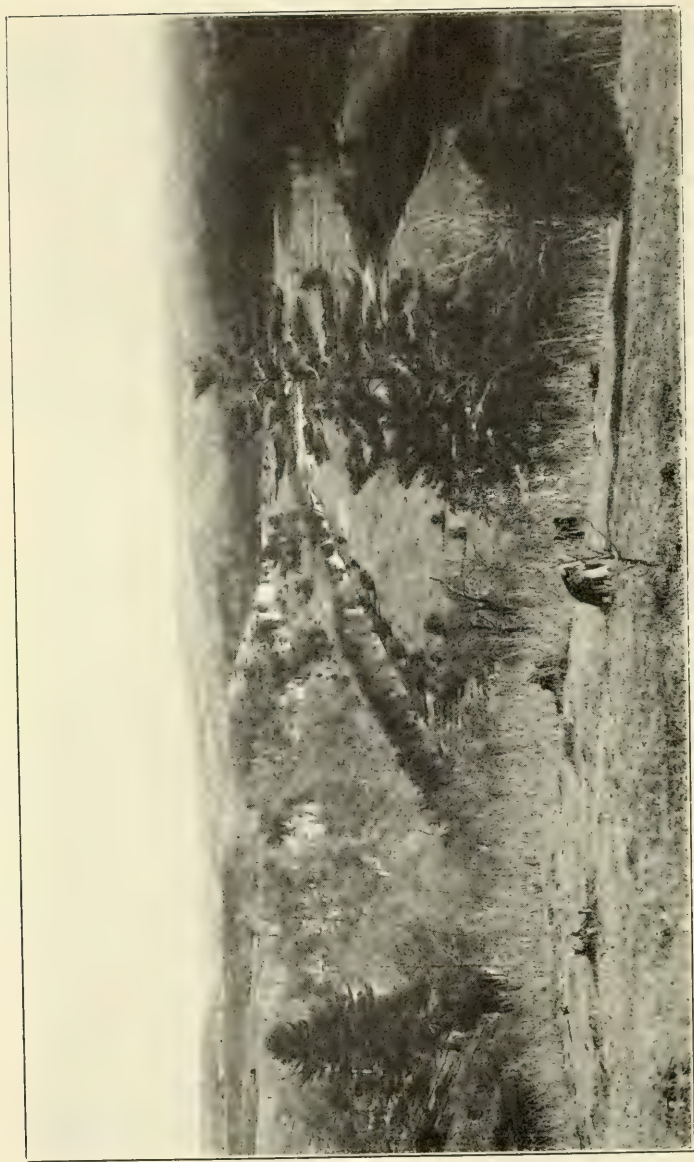
White Pines at Wildcat Den, Muscatine County.



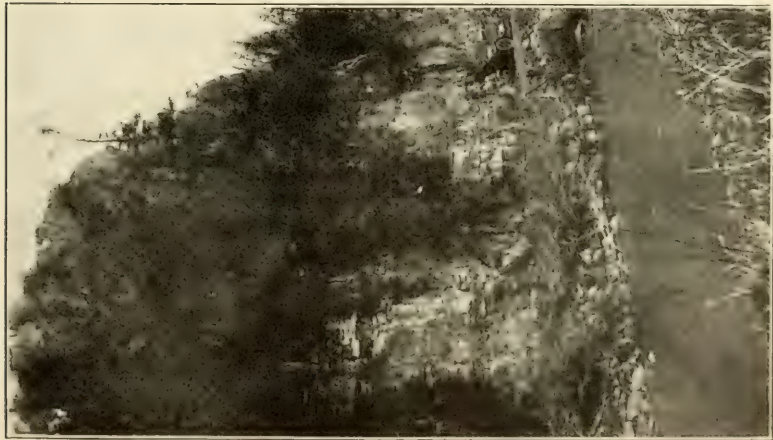
Beard Tongue, Western Iowa Loess Bluffs.



Sunset on Lake Okoboji.



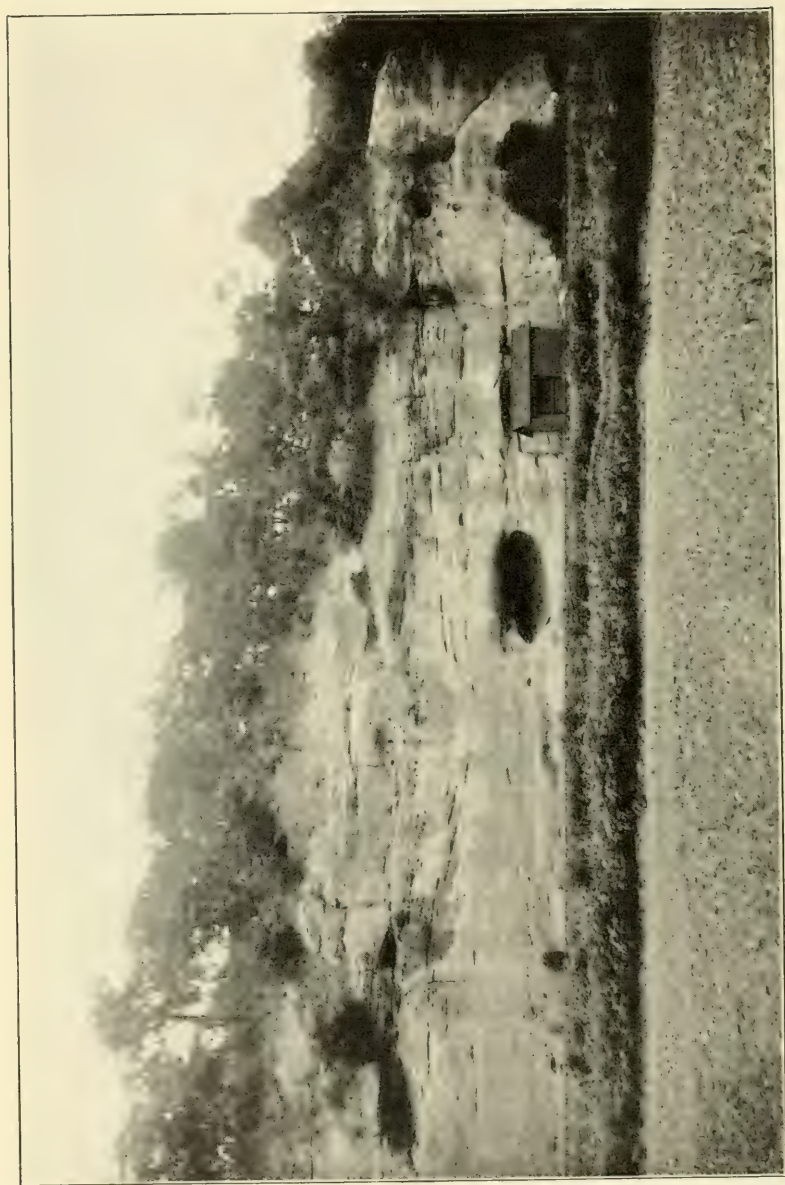
Devil's Backbone Park, Delaware County.



Park Site, Waterville, Allamakee County.



Anemone, Linn County.



Wall of Rock Near Monkey Mountain, Wapello County.

leaf. As the birdman sees it from the upper air so the color connoisseur may enjoy the sight from this bit of terra firma.

The view in every direction is limited only by the short range of human vision. With a good glass one may overlook ten railroad stations and the valley of Lime Creek to the northwest, west, south and southeast. This river is skirted with native timber not yet entirely destroyed.

With the Park area of Pilot Knob there are other mounds of less altitude, and among these hills a small lake nestles so like a brooding bird in its nest that many fail to find it. It has abrupt shores nearly the whole distance around, and no outlets unless the water is very high. It is bordered by a variety of native trees and shrubs where the shy vireo builds her nest in peace and aquatic fowls frequent its waters to feed and to breed in the tall grasses nearby. In its waters grow three species of pond lilies, one of which I am told is found nowhere else in Iowa. The lake is frequented by botanists in search of rare specimens of plants and shells. With slight expense it could be dredged so that fish might be planted. Dead Man's Lake is a gem in Nature's diadem, placed there when the grinding in the mills of God ceased in these parts.

Within the area that ought to be included in a park are all the native trees and shrubs common in this region—walnut, ash, basswood, wild cherry, burr-oak, Jack-oak, red oak, and others. In addition to these there is a nice grove of white oaks, found nowhere else in all this region so far as I know.

The rare species of pond lily and the white oak grove, neither of which is sacred in the possession of the average farmer, ought to appeal to the nature-lover and to the Iowa lover, inducing them to act as guardians of the future. Generations to come are the heirs of the wisdom or unwisdom of our procedure.

This area of three or four quarter sections would be a good place for a game preserve, and with slight improvement in the matter of roads access to the interesting points could be arranged to accommodate tourists and picknickers. Everyone who visits this region and views Pilot Knob goes away feeling that it isn't necessary to cross the continent or ride the ocean waves to see the handiwork of God and the triumphs of man from the same spot at the same time.

Indulge me for a further moment while I tell you in rhyme of some of the impressions made on me during one of my early visits to

PILOT KNOB.

Speak, Pilot Knob, tell me thy tale.
I would know more of thy story,
When didst thou erst the morning hail?
Naked but grand in thy glory.

Where in the north did God's great plows
Loosen this pile, earth and boulders?
Out of what bed didst thou arouse?
Brought to this spot on whose shoulders?

"Glacial moraine," geologists say;
 'Left by the last ice invasion,
 Youngest addition of pebbles and clay,
 Ground by a slow rock-abrasion."

Ages ago methinks I see
 Rivers of ice on the prairie—
 Mills of the gods—and this is the debris
 Humped like a huge dromedary.

Iowa's plains were leveled for man,
 Smoothed and made fit for his using,
 When in God's wise, mysterious plan,
 Landmarks were left of His choosing.

Old without doubt but thou art young,
 Timed by the clock of world-making;
 Absent, unborn when the stars were hung,
 Heard not old Earth's primal quaking.

Centuries come and centuries go,
 Speechless thou standest, beholding
 Changes which only centuries know,
 Changes of race and race-molding.

Nations are born, empires decay,
 States are redeemed from the savage—
 Such changes are the work of a day
 Measured by thee and time's ravage.

Thou didst stand guard when the Redman came,
 Saw his rude hut, his chaste wooing;
 Pastur'd the wild swift-footed game,
 Witness'd the hunter pursuing.

Beacon wert thou to early guides
 Crossing these wild tractless regions?
 Ah, beacon still, and one that abides,
 Gone are the brave dusky legions.

Hunters and warriors have pass'd on,
 Pass'd to the wierd realms of shadows,
 Paler-faced tribes came west with the dawn
 Searching for new Eldorados.

Men digging wealth from the vale and plain
 Viewed from this Knob, bare and ancient
 Likewise shall pass, but thou wilt remain,
 Preaching the truth that we're transient.

GITCHIE MANITO PARK.

The extreme northwestern corner of Iowa is a part of a larger area which is one of the beauty spots of the North American continent. It possesses great interest historically, prehistorically, scientifically, fictionally. Twenty acres in the northwest quarter of section 11, (Tp. 100 N., R. XLIX W.) would be representative of 50 square miles.

Nowhere perhaps on the face of our globe does there exist a bit of landscape more picturesque, more unexpectedly novel, or more curiously

wrought into strong contrasts of relief than found about the point where we meet the three great prairie states of Iowa, Minnesota and South Dakota. It is the very midst of the Great Plains which stretch out unbrokenly from the Arctic ocean to the Mexican gulf. It is a part of that tract which early French explorers and *coureurs de bois* were pleased to call the Coteau des Prairies; and which an English trapper designated the Height of Land. For its size and altitude it is the most scenic spot on earth.

In this region are perfectly represented in miniature some of the grandest relief features of every clime; Grand Canyon of Arizona, the Royal Gorge of Colorado, the majestic escarpment of Glorietta, the pinnacled Dolomites of the Eastern Alps, the rock-walled lakes of northern Italy, the boiling rapids of Finnish Imatra, the leaping brooks of Norway, the broad water-curtain of Niagara, and about all the boundless Girghiz Steppes. In days gone by also there covered this land glaciers compared with which existing ice-fields sink into utter insignificance. Formerly lofty volcanoes poured fourth their floods of molten rock. Alone of all great landscape types mountains are missing. Once these too were here, but today they lie buried beneath the level of the singularly flattened and monotonous prairies.

At the present time there are, within the limits of the area of which we speak, few traces in any of the relief features to indicate that there ever existed here a high and mighty mountain range. The ground is perhaps a little higher than it is either to the east or to the west. The country to the north is indeed a low water shed. Plain is the dominant topographic expression of the entire region. In all directions the eye has unobstructed view for distances of many miles. Even the horizon is unbroken by hill-form or valley depression; it is as straight as the skyline at sea. Travelers at the railroad stations see afar a full half-hour before the train arrives the black-smoke-cloud of the approaching locomotive.

Of the lofty mountains which once loomed up on the horizon every vestige at the surface has long since vanished. They are leveled to the sea, lost and forgotten. Today their foundations are slowly exhumed by the corroding action of stream and rain; and here and there the old structures are being brought to view. The traces are many but inconspicuous. Recently through means of the records of many deep well borings and other data the height, extent and form of the ancient mountain ranges has been fully figured forth, and its characteristic features pictured out. This great earth wrinkle which sprang from the sea in Mesozoic times extended from the east shore of present Lake Superior southwestward beyond the path of the Missouri river. Medially the rocks were bowed up more than a mile above the existing level of the prairies. In their prime these Siouan mountains rivaled in scenic beauty and grandeur the Adirondacks, the southern Appalachians or the Juras of today. The Jove and Boreas and Vulcan each laid claim to them; and each did his work of demolition quickly and well. They reduced the majestic pile of adamantine down to the very level of the ocean, when Neptune gathered it to his own.

Although now no remnant of former mountains remains in the relief expression of the region and the entire area of once high altitudes is as level and as smooth as any other part of the vast interior plain, there persists beneath the glacial mantle, mountain structures as well pronounced and as typical as they are anywhere else in the world. The broadly arched strata, the folded formations, the faulted rocks, the intrusions of once molten magmas, the prodigious extravasations of volcanoes, are familiar features which are characteristically developed. The evidences or orogenic uprisings are unmistakable. Seldom to the geologist are mountain phenomena more clearly depicted. Form, extent and stratal attitude are measurable with great precision.

The discovery of the old and long-buried mountain range is a matter so recent and so instructive that a brief state of the manner of its finding is not without distinct interest. It well illustrates the method of modern scientific venture beyond the confines of the known. By peeling off, as it were, the thick Cretacic and glacial coverings of the area the entire Mesozoic floor is laid bare, and the Paleozoic formations then constitute the uninterrupted bedrock of the whole region. By what is essentially the same thing elimination of these later coverings is accomplished by plotting the numerous deep-well records and other data relating to the underground structures.

Casually referring to a general geological map of the area, the various Paleozoic terranes are seen to be distributed in relatively narrow belts trending in a northwest direction. Singularly these belts in southern Minnesota abruptly terminate. The cause has been long perfectly inexplicable. It is now found that the most ancient rocks form the core of a rather notable arch, the axis of which is directed northeastwardly. It is a true anticline structure of large proportions and great longitudinal extent. After the country had been bowed up it was planed off quite to sea level. It is against this anticline that the belted Paleozoics are upturned and cut off. Indeed, they too once extended unbrokenly over the old arch. In northern Minnesota and in Manitoba the same belted formations abruptly appear again. The discovery is a result of inductive reasoning that is quite remarkable. The whole problem was, in fact, fully worked out before its proofs were even sought in the field. Lines of reasoning and results of extensive observation are in strict accord. Discovery was made before the facts themselves were even presented.

Rarely in so small a compass is there so well displayed the effects of every great geologic process known. For countless ages fire, flood and frost have played upon these rocks without completely effacing them. Volcanic outbursts have seamed, seared and smelted these formations until often they are almost beyond recognition, but they are not yet destroyed. When rains have failed to wash these rocks away or the rivers have been unable to wear them down, the sea has time and again cut into them or carried them hundreds of fathoms deep, yet they have reared themselves again above the surface of the engulfing waters. Heat and sun and chill of ice have alternately contended in flaking off the rock surface, still they have ever presented new faces to these insidious attempts at their destruction. Winter blasts and the siroccan

winds of summer have blown the rock areas bare and clean as a city pavement, and the wind-blown sands and dusts have rounded off all corners and polished all surfaces until the hard vitreous blocks appear as if fused in a furnace, without seemingly making any marked impression. Continental glaciers have repeatedly passed over the region, planing off the glassy masses as a joiner does his beam of wood, and deeply grooving the smoothed facets as by some giant graver. Compression and arching of the earth's crust have uplifted the country into mountains, but they have signally failed to destroy the rocks.

The sudden appearance and rapid decline of the Siouan mountains on the mid-continental horizon are incidents of the Mesozoic age of geologic history. Brief, brilliant, almost pathetic are the succession of chief events. The main uplifting took place during the Triassic period. In the succeeding Jurassic and Comanchian times all of the ranges were completely razed to the present plains-level. During Cretacic time the waters of the ocean again rolled unbrokenly over the old base-leveled region, and the bared foundations of the former mountains formed the bottom of the broad epi-continental sea. No great orogenic uplift was ever more rapidly or more completely obliterated. It is one of the marvelous episodes in the long history of the North American land contest.

In still another way the Siouan area is quite notable—perhaps the most remarkable spot of our country. It is one of the completest of outdoor laboratories for geological instruction. With an areal extent scarcely larger than that of some of our larger cities, it is a unique study ground. It is a veritable geologic multum in parvo. In this circumscribed district is represented every known category of the geological agencies. The whole panorama of geological science is spread out before one's eyes. Apt illustration abounds of the major phenomena pertaining to the origin, structure and modification of the earth's crust.

The Siouan area is a locality where the cardinal principles of earth science may be best taught by example and in the least possible period. In a week's time the entire list of princpal processes and products may be passed in review in the field. In going to and from this spot another week's time permits examination of the most complete stratigraphic section of the continent and a review of the evolution of life generally. As the culmination of a year's study of geological science indoors this place is well worth a visit by every college student and teacher in geology. It is, in fact, the most typical, most compact, and illuminating area yet revealed wherein students may perform in a little while extensive geologic field work of a most practical kind. It is here that the outlines of field geology are acquired at a glance. The foundations are here quickly laid for all broader and subsequent geologic excursions into the farthestmost points of earth.

The realm of the ancient Siouan mountains is also famous in poetry and Indian lore. Principal scenes of Longfellow's "Song of Hiawatha" are laid here, although when he wrote the epic it is not probable that the poet had ever been nearer the place than the Cambridge gardens on the shores of Back Bay.

In the unwritten annals of the Sioux Indians, who once roamed over a large part of the continental interior, the Des Moines river was known as the Inyan-Sha-Sha-Watpa, literally, "Stone, red-red-river," or the Red-stone river. This Indian name has peculiar significance. When European eyes first beheld it and for a period of more than two centuries thereafter this noble stream was the only all-water route in all the land by which, without getting out of his boat, Indian and fur trader could traverse the continent from the Arctic Ocean to the Gulf of Mexico.

The headwaters of the Des Moines river, or Inyan-Sha-Sha-Watpa, are in the red quartzite district of the old Siouan mountains; but the red stone is the famous catlinite found associated-the much-sought stone from which the calumet or peace-pipe was wrought. From the pipestone ledges of the broad prairies spread peace on earth and good will towards men to the farthestmost limits of the continent, to the remotest corner of the Indian world. Forty centuries before the Nazarene appeared on earth this spot was solemnly consecrated to the cause of world-wide peace.

GEOLOGY OF LYON COUNTY.

By Frank A. Wilder, Geologist.

The Sioux quartzite or "granite," as it is commonly called, appears on the surface in a single township in Lyon county. The area in Minnesota and Dakota, however, within which exposures of this rock are common, is considerable. As stated by Beyer its extreme eastern limit of outcrop is found at Redstone, and its most westerly exposure is near Mitchell on the James river. Its greatest width is about sixty miles, extending from Flandreau on the north, to Canton, which is on its southern border, giving a total area of more than 6,000 miles. Its thickness has been variously estimated, but on this point there is little on which to base a positive assertion. Well drillings have not passed through it, though they have entered it to a considerable depth, and there are no great folds or flexures. It is thought by Todd, of the South Dakota survey, and by Beyer that its thickness does not exceed 1,500 feet.

Instead of quartzite, originally the formation was water-laid sand. Proofs are still present in the ripple marks and lines of lamination and stratification. The layers varied in thickness from two feet to half an inch. Cross bedding was not uncommon, indicating that, in places at least, the sand was deposited by rapidly running water. These characteristics are still preserved in the quartzite. Subsequently the sand was permeated by water holding in solution silica which crystallized around the sand grains and cemented them together, producing a solid quartz mass. Microscopic study of the quartzite by Irving and Van Hise has made clear the fact that the silica which forms the matrix has been deposited along the lines that correspond with the crystalline axes of the several grains. The interstitial deposit of silica explains the unusual firmness of the rock. The same observers made clear that while silica

was deposited about all the sand particles, frequently the quantity was not sufficient to fill all of the spaces between the grains. As a result, a sandstone easily crumbled was produced. Throughout the quartzite this condition exists. In close proximity to quartzite and in the same beds the rock shades off into friable sandstone and even into uncemented sand. These softer layers are generally thin and quickly give place to the normal quartzite. Well drillings that have penetrated the quartzite show that in the midst of the harder rock there are at times several feet of sand. An example of this sort is found in the well of the B. C. R. & N. railroad at Ellsworth, Minn., one mile north of the Lyon county line, where the quartzite was encountered under 180 feet of drift and fifty feet of shale. It was penetrated to a depth of 315 feet, and frequently sand layers of considerable thickness were found. The color of the rocks varies from pink to purple, red being most prevalent. The coloring matter is oxide of iron, which forms a thin coating around the quartz grains. Near the upper surface and along joints leaching has evidently taken place, for the colors are dull. As determined by the Minnesota survey the rock is composed almost wholly of quartz; 85.52 per cent consisting of that material.

On the surface the quartzite is found in but two sections of a single township in Lyon county, and is nowhere exposed in Sioux county. These sections are 7 in Tp. 100, N., R. XLVIII, W., and 11 in Tp. 100, N., R. XLIX W. The first named exposure is found in the north central part of the section and may be seen from the road on the state line. The outcrop is in the bottom of a small valley and is perhaps fifty feet wide with a total length of half a mile. Erosion has removed the drift over this limited area exposing the quartzite which, doubtless, underlies it throughout this corner of the county. Thirty miles to the west it is known that the Benton shale intervenes. Section 11 of range XLIX is in the bottom lands of the Big Sioux. The quartzite here exposed is in the form of a ridge 100 yards wide and 400 yards long, rising to a height of twenty feet. In the bluffs just across the river an exposure of quartzite, evidently a part of this same ridge, rises to a height of fifty feet. The dip of the rock at both the Iowa exposures is six degrees north. Its characteristics are those common to the quartzite in other localities. The metamorphism is general but not universal. Occasionally the rock is soft enough to crumble between the fingers. The joint planes are in two sets at right angles to each other and from two to ten inches apart. In section 7 there is a beautiful example of oblique lamination. On the same exposure are remarkable glacial striae and grooves. Apparently the drift has but lately been removed from the surface. The maximum depth of the grooves is eight inches, which is considerable when the hardness of the rock is taken into account. There are two distinct sets of striae, one evidently more recent than the other, since in places one is erased by the other. The corrected readings for these striae are S. 30 degrees E. and S. 5 degrees W. It is not necessary to suppose that they represent two ice sheets. The second set was probably formed by the same ice sheet that was responsible for the first, the change in direction indicating the direction of the ice movement during its recession.

The quartzite, doubtless, underlies both counties, though buried deep by drift and Cretaceous deposits. On Lu Peter's farm near Little Rock, on the eastern boundary of Lyon county, it was encountered beneath the shale and drift at a depth of 360 feet. At Ellsworth, Minn., near the northeast corner of Lyon county, it was found beneath similar material at a depth of 281 feet.—Iowa Geological Survey, Annual Report, 1899, pp 98-100 and 105-7.

THE SIOUX QUARTZITE.

By Samuel Walker Beyer, Geologist.

The Sioux quartzite is a southwestward prolongation of "Minnesota Point." It extends across the northwestern corner of Iowa and underlies about equal areas in South Dakota and Minnesota. Its extreme eastern limit of outcrop is marked approximately by Redstone, at the junction of the Cottonwood and Minnesota rivers, while its most westerly exposure is near Mitchell on the James river. It has a maximum width of sixty miles extending from Flandreau, its northern limit, to Canton, just within its southern boundary. The formation, although generally concealed by glacial debris and by scattered patches of Cretaceous, probably extends over an area of more than 6,000 square miles.

A southwestward extension of the "Coteau des Prairies" traverses the quartzite area at right angles, a short distance east to its middle, forming a watershed for the tributaries of the Mississippi and Missouri drainage systems. The crest of the Coteau, at its middle point in the quartzite area, has an elevation of nearly 2,000 feet above sea level. There is a gentle slope westward to the James river, which, in the vicinity of Mitchell, has an altitude of about 1,200 feet. The eastern slope inclines rather more rapidly toward the Minnesota river, where, near the mouth of the Cottonwood, the elevation is considerably less than 1,000 feet. The divide which separates the Red river valley from the valley of the Big Sioux lies some distance to the north of the quartzite belt, so that the surface of the formation as a whole pitches southward at a low angle. The Big Sioux river, with its tributaries, drains the major portion of the area covered by the quartzite in Dakota.

The streams have high gradients, and have deeply incised the region. Rapids and falls are not uncommon. The flood plains are narrow, and in some instances, as along the Split Rock creek at the "palisades" and the Big Sioux at Dell Rapids, there are canyons whose vertical walls range from fifty to seventy feet in height. In both of the above cases, canyon cutting is not confined to the main stream, but is being performed by the side branches as well. As an illustration of the sculpturing done by the short lateral branches, may be mentioned a case which occurs about one mile north of the Palisades. At this point a gulch makes off at right angles from the main stream and extends eastward more than a mile. It is a narrow gorge which, in places, has reached a depth of from seventy-five to nearly 100 feet. This appears the more striking

in that the surface features of the prairie give no indication of the presence of the gorge until one is in close proximity to its edge. The erosion forms developed in the quartzite area are well shown at Jasper pool in Lyon county, Iowa.

The special area in question is located about twelve miles northeast of Sioux Falls. Corson station, on the Great Northern Railway, is just within the southern limit of the area and is a central point in the great quartzite region. Split Rock creek, a tributary of the Big Sioux, meanders through the area from north to south and is flanked on either side by a chain of hills, the summits of which rise to a height of nearly 100 feet above the channel of the stream. The valley of this stream measured from crest to crest, is about one mile in width. Near the northeast corner of the northeast quarter of section 15, an isolated hill, Keyes knob, rises within the valley and is the most prominent topographic feature in the vicinity.—Iowa Geological Survey, Vol. VI, pp 71-4.

MISCELLANEOUS
SUGGESTED AREAS

Miscellaneous Areas, Authors—

BAIN, H. F.
BARKER, W. W. H.
BURGESS, E. A.
CALVIN, SAMUEL
COLE, ELI JR.
HARLAN, E. R.
KAY, GEORGE F.
LEES, JAMES H.
LEONARD, A. G.
MACBRIDE, THOMAS H.
PAMMEL, L. H.
RICKEY, LACEY F.
SAWYER, MRS. CAROL
TUTTLE, FLORA MAE

MISCELLANEOUS SUGGESTED AREAS.

NUMEROUS PLACES URGED BEFORE THE COMMISSION AS SUIT- ABLE FOR STATE PARKS.

THE CEDAR VALLEY NEAR OSAGE.

By James H. Lees, Geologist.

The valley of Cedar river presents many fine picturesque spots within a few miles of Osage. From the river bridge directly south of town up the stream as far as Mitchell the valley is bordered in many places by steep rocky bluffs which with their timber covering and the hardy conifers clinging to their faces and finding precarious footing and sustenance among their cracks and crannies afford excellent spots for rest and recreation. In some cases these bluffs border the water closely, there being only a narrow talus slope at their foot, along which a devious path has been made by the numerous visitors. There is in almost all cases, however, a level flood plain across the river which would afford good park spots. Among these localities are several fine bluffs on both sides of the river within the first half mile above the bridge south of Osage (Pierce's bridge), where the ground spruce and the cedar add variety to the more common flora of oak and elm. A short distance above the bridge southwest of Osage (Middle bridge), there are several rocky cliffs and a fine spring or series of springs, which keep the river open here through the winter. About a quarter of a mile below the wagon bridge west of town and the same distance above the bridge are splendid vertical cliffs which would afford fine beauty spots. Both of these localities have a crown of timber which extends back into the upland for some distance. The lower bluff contains a small cavern and on its face from the proper position one may see the profile of an Indian head in massive proportions. The bluffs above the bridge are what are known as the Chandler Cliffs. They are located just above the old dam which once furnished power for the electric light plant, but which is now washed out. It could be replaced with relative ease and would then afford an excellent backwater pool for boating and bathing. The high rocky vertical cliffs would make a splendid background, and the place is easy of access, as it is close to the main road west from Osage. The business men of Osage have done a fine piece of constructive work in establishing a small park of about forty acres along the river southwest of town. A low dam has been thrown across the river, a club house built in the timber covering the low plain which lies between the stream and the valley wall, and best of all a great spring which gives its name to the park has been walled up and made to add its beauty and service to the scene. The stream flowing from the spring is filled with watercress, which gives a

delightful touch of green even in the midst of the winter's snows. Across the river there rises from the water's edge a great massive battlement of rock which adds its changeless beauty and grandeur to the whole delightful assemblage of attractions.

Dr. Calvin states in his description of the geology of the county that Cedar river has evidently had a long and changeful history. Its valley owes its size and rugged character largely to preglacial, or at any rate to pre-Kansan erosion. It was formed before the Iowan ice-sheet, the last to invade this region, came down and filled it with ice. I can do no better here than to quote from Doctor Calvin's report on Mitchell county, where he says: "There has been no permanent filling of the valley with drift. In type this waterway is allied to the waterways of the Driftless Area. There are the original precipitous rocky cliffs rising vertically from sixty to eighty feet and the total depth below the level of the upland plain ranges from ninety to 120 feet. The sides of the Cedar river valley are cut by deep erosion trenches, recalling the topography of the Driftless Area, or areas of thin Kansan drift; and the tributaries, few and insignificant though they are, enter the main stream through rock cut troughs and gorges."

Another remarkable feature of the region bordering the river west of Osage is the fact that although most of the region is covered with drift from the Iowan glacier, there rise out of it and above the general level, what Doctor Calvin called loess islands. These are tracts which the Iowan ice either did not cover or on which it failed to leave any coating of clay and other debris which it carried. Hence the older topography and materials of the Kansan plain remain, mantled only by a thin veneer of loess, a fine dustlike material blown hither from the Iowan drift plain very soon after this was uncovered by the melting of the ice. Thus we have here a typical example of the topography and surface mantle of a region which is vastly older and more mature than are those of the Iowan region. This older topography, that of the Kansan drift, once covered all of Iowa except the strip in the northeast known as the Driftless Area. But it has since been overridden in the northcentral portions—from Winneshiek to Osceola counties—by later glaciers and its characters have been more or less completely masked. This Osage loess island, therefore, takes on added interest both because of its proximity to the picturesque features of Cedar Valley and of its typical display of characters which are related to the Kansan drift region of Winneshiek county and the counties farther south.

FLORA OF MITCHELL COUNTY.

By Flora Mae Tuttle.

From the time that I opened my eyes on the beauties of our glorious prairies, down in that little log cabin in Delaware county, I have been deeply interested in the flora of our state. Years ago the unbroken prairies were one gorgeous flower garden. The wild lily, the painted cup, fireweed, ironweed, blazing star, vied with the golden glory of the sun-

flower and goldenrod; some of these have so nearly become extinct, that every bit of unbroken prairie is sacred ground.

A large part of the data gathered has been in the vicinity of Osage, but I have always made it a point to study every locality; and with this conclusion, that Osage township is typical of the rest of the county. Here we have river, creek, pasture, waste ground, bluffs, a very little low ground, sandy soil and bayous, each clothed with its own typical verdure.

Some of the localities given after the names of the specimens found, are purely local and therefore need a word of explanation.

The "Old Farm" is known to geologists as the Gable Farm in Calvin's Geology of Mitchell County. Two years of my childhood were spent here, and I shall never forget the delicate, fragrant beauty of the banks of Sugar Creek in the springtime when they were covered with the blue, pink, and purple tinted hepaticas, our mayflower. Here, too, grew Adam and Eve in conjugal bliss, the bloodroot, spring beauty, blue phlox and wild geranium each in its time and place. The road to school for a quarter of a mile lay through dense woods, now long since cut down, and sister and I dreamed dreams, and lived wonderful stories, as our weary feet plodded home from school. The dark green of the oaks, the trailing virgin's bower, and wild grape, or the crimson shades of the maples in autumn, made an artist of one little girl and a naturalist of the other.

Pierce's bridge is one of my favorite haunts, and has revealed many secrets hid in Mother Nature's story book. There I found the rare grey birch—fifty of them; the fragile cliff brake growing from a crack in the limestone bluff; and here too I put three blind baby woodchucks to sleep one Memorial Day—but that is another story.

The Cedar river, or Wa-shood Ne-shun-a-ga-tah, Big Timber river, as the Winnebagoes once called it, makes a big curve in Osage township, circling about Osage with a radius of two miles from west to south. Pierce's bridge is south of Osage; the Middle bridge is southwest, and two miles west of Osage on Main street is another bridge. The most bewildering experience that ever came to me, was on the day I found the colony of deep blue-purple *Chelone glabra* or turtle head near the Middle bridge. They stood all of five feet tall in the brink of the river, close to a bubbling spring. Every year they come true as to color. This same mutant has been found near Pierce's bridge by Mrs. Walter Wheeler, of Osage.

The Old Lime Kiln road leads out of Osage southwest to the Middle bridge and is bordered on one side by vertical bluffs, and on the other side for some distance by Sugar Creek.

Spring Park is a tract of about forty acres of land owned by an association for a picnic and camping site. Here is found a wonderful spring flowing the year round. From it flows a little brook filled with water-cress, blue iris, yellow marsh marigolds, and bordered by a large colony of the sensitive fern.

A forest expert on strolling through these grounds one day counted eighty-one varieties of trees. Millions of the supposedly rare muscatel grow here, and on a bank overlooking the spring are found the showy orchis; while down in a moist spot have been found the Indian pipe or corpse plant.

The river road follows the bank of the Cedar river for about six miles from the bridge west of Osage up the river to Mitchell. It is one of the prettiest bits of scenery in Iowa. The peacefully flowing river, with the wonderful reflections of tree and cloud on one side while to the right rise sheer bluffs of limestone, draped with the graceful bladder fern and its twin sister, *Cystopteris fragilis*, wild grape, moonseed and clematis vines with a touch of coral colored columbine, or pink and yellow honeysuckle, in their season. If you search carefully in a shaded portion on top of the bluff you may find the lady slipper, *Cypripedium pubescens*; while clinging close to the water are the so-called lady slippers more properly known as jewel weed, both *I. pallida* and *I. biflora*.

The Winona track leading out of Osage to the southwest, once a proposed railroad, is now only a trail, where hundreds of feet hurry away in the springtime, when we hear that the pussy willows are out or the May flowers in blossom.

The Old Mill too is a misnomer now, for all that is left of it are the old mill stones and the weed grown race. This lies about half way between Pierce's bridge and the Middle bridge. It is so dense and damp down in there that one is sure to find some new treasure of bird, bug or botany.

The Ryan Farm lies on the prairie road that runs between Osage and Mitchell and just off from the river road. It is one of my favorite haunts not only because of the natural beauties I find there but because of the hospitality of its owners.

The Indian Head Bluff is on the east bank of the Cedar river about a quarter of a mile down from the bridge west on Main street. Here we find again the combination of bluff, river bank and field pasture, that brings such a varied flora. The base of the bluff is an example of one of the most puzzling non-conformities in Iowa, while the upper layers of rock strongly resemble the features of an Indian, with a juniper or red cedar tree for a scalp lock.

Pelton's woods is a wood tract a quarter of a mile south of the fair grounds, in Osage. They are never disturbed save as the writer and her friends search for birds and plants. The shield ferns here grow to enormous size, and here also is a large colony of the sensitive fern, while occasionally in the heart of these woods we have found the showy orchis.

BIXBY PARK, CLAYTON COUNTY.

By L. H. Pammel, Botanist.

Some men and women for the pure love of nature have whole-heartedly set aside areas to be preserved so that not only the present, but future generations can enjoy what has been given to us. Mr. W. J. Bixby, of Edgewood, a former member of the house of representatives from Delaware county, has purchased a tract of land in Clayton county so that others might enjoy what he and Mrs. Bixby have long enjoyed. During

the autumn I had the pleasure of going to this region, as a guest of the Bixbys. It was indeed, a rare pleasure to view one of the beauty spots of Iowa.

Leaving the rolling fertile Iowa prairies, with their cornfields and green pastures, we went into a long ravine with a gently sloping road, both sides of the road being lined with one of the most gorgeous display of goldenrods and asters I have ever seen. The autumn tinge of the sumach, dogwood and hard maple covered the steep slopes. The little side ravines were dotted with the hard maple, white oak, quercitron oak, red oak, hickory, slippery elm, basswood and butternut. This ravine connects with a larger one, the real mecca of the lover of nature. A beautiful stream of pure water fed by springs comes from the adjacent outcrop of limestone. On the steep a carpet of the Canadian yew under the tall gray or sweet birch, red oak, butternut, bitternut, basswood and hickory and white or paper birch. In the little narrow valley were the great red oaks, sugar and black maple and basswood. Every moist rock on the hillside was covered with great masses of the bladder fern and great bunches of osmunda and spleenwort presented a paradise for the lover of plants and the lover of wild life in general. Not a tree has been cut in this area, except where it was necessary to do so for the general good of the preserve, since it is the idea of Mr. Bixby that this place shall be a park, in the true sense of the word.

My botanical work here was done somewhat hurriedly, but I noted the following plants in the region. (The list is not arranged in systematic order). Aster (*Aster sagittifolius*), *A. Drummondii*, *A. laevis*, *A. sericeus*, *A. Novae-angliae*, *A. novibelgii*, *A. multiflorus*, *A. umbellatus*), golden rods (*Solidago canadensis*, *S. serotina*, *S. ulmifolia*, *S. latifolia*, *S. speciosa*, *S. nemoralis*), boneset (*Eupatorium purpureum*, *E. ageratoides*, *E. perfoliatum*), ferns (*Cystopteris fragilis*, *C. bulbifera*, *Asplenium Filix-femina*, *Adiantum pedatum*, *Pteris aquilina*, *Onoclea sensibilis*, *Polypodium vulgare*, *Woodsia obtusa*), grasses (*Cinna arundinacea*, *Leersia virginica*, *L. oryzoides*, *Bromus purgans*, *B. ciliatus*, *Muhlenbergia sylvatica*, *M. Mexicana*, *Poa pratensis*, *Andropogon scoparius*, *A. furcatus*, *Elymus virginicus*, *E. canadensis*), oaks (*Quercus ellipsoidalis*, *Q. alba*, *Q. acuminata*, *Q. velutina*, *Q. rubra*, *Q. macrocarpa*), hickories (*Carya ovata*, *C. cordiformis*), walnut and butternut (*Juglans cinera*, *J. nigra*), maples (*Acer nigrum*, *A. saccharum*, *A. saccharinum*, *A. negundo*), ninebark (*Physocarpus opulifolius*), cherries (*Prunus americana*, *P. serotina*, *P. serotina*, *P. virginiana*, *P. pennsylvanica*), service berry (*Amelanchier canadensis*), crab and haws (*Pyrus Iowensis*, *Crataegus mollis*, *C. punctata*), dogwoods (*Cornus asperifolia*, *C. alternifolia*, *C. circinate*, *C. amomum*), sumach (*Rhus glabra*, *R. hirta*, *R. toxicodendron*), honeysuckles (*Lonicera glauca*, *L. Sullivantii*, *Diervilla trifida*), buckthorn (*Rhamnus lanceolata*) basswood (*Tilia americana*), poplars and aspen (*Populus deltoidea*, *P. grandidentata*, *P. tremuloides*), ashes (*Fraxinus lanceolata*, *F. nigra*), red cedar (*Juniperus virginiana*), yew (*Taxus canadensis*), wild grape and Virginia creeper (*Vitis vulpina*, *Ampelopsis quinquefolia*), moon seed (*Menispermum canadense*), hazel (*Carylus americana*), red raspberry, black cap raspberry (*Rubus strigosus*, *R. occidentalis*), Spring beauty (*Claytonia vir-*

giniana), Dutchman's breeches (*Dicentra cucullaria*), violets (*Viola pubescens*, *V. cucullata*, *V. delphifolia*, *V. pedata*), hepatica (*Hepatica acutiloba*), trillium (*Trillium erectum*), May apple (*Podophyllum peltatum*), blue cohosh (*Caulophyllum thalictroides*), meadow rue (*Thalictrum dioicum*), moccasin flower (*Cypripedium pubescens*).

This list is only a partial and very incomplete one. It shows, however, the interest attached to the region, from a scientific standpoint.

TETE DES MORTS AND VICINITY.

By Eli Cole, Jr.

In looking over the township map of the state of Iowa one's attention is immediately arrested by a certain township bearing a peculiar name, and not like hundreds of others bearing the name of some American statesman, or some geographical significance.

This township referred to is located in the northeast corner of Jackson county, and is named Tete des Morts. This name was given in 1684 by Father Louis Hennepin and his associates, La Motte and Le Fevre.

The town of La Motte is located on a high hill seven miles westward, and the name Le Fevre was given to the river opposite Tete des Morts, an affluent to the Mississippi which in the two decades prior to 1860 bore a large commerce, for Galena, Illinois, located thereon was then the metropolis of the west.

Tete des Morts township was necessarily one of the first townships in the state of Iowa to be settled by the white man, by reason of its proximity to Galena, being immediately opposite and across the Mississippi river from Galena, Illinois, situated on the Fevre river.

It was according to tradition the battle ground between the Winnebagoes, Sacs and Foxes on the one side and the Sioux on the other, wherein the Sioux were victorious and drove their adversaries over the high cliffs bordering on the river and was given that suggestive name by the Jesuit missionary, Father Louis Hennepin, "Tete des Morts" or the "Head of Death."

The name given, however, was not the sole and only distinction, but it was in an early day of Iowa history settled by French and until recently the French language and Luxemburg dialect was the sole medium of speech. French and foreign customs have ever prevailed and it seems like a little French island surrounded by an immense American sea. No more picturesque village is to be found on the American continent, out-sideside of Quebec Province, and it has ever retained every foreign and antique characteristic, than the village of St. Donatus, changed in 1870 by the United States from Tete des Morts.

The creek is still called Tete des Morts and is one of the chief charms of the valley winding through a broken and rugged country until its confluence with the Mississippi whose capacious and insatiable maw seems never satisfied with these hundreds of little feeders.

Only until recently has this attractive little village been visited by the tourist, and since the advent of the automobile, many thousands tour from Bellevue, the scene of the historic "Bellevue War" to Dubuque via Tete des Morts—the main charm of the drive.

Due credit must be given Harper & Bros., New York publishers, for bringing this section into the limelight and by reason of their extensive write up some years ago, was one of the main incentives to promote tourist travel in this beautiful and quaint village.

This village has peculiarities strictly its own. The houses are adobe, each separate and distinct in itself, no partition walls whatever, with a generous garden patch and vineyard.

The church (Roman Catholic) and convent are located on a high hill, the twelve stations of the cross being brought into bold relief by reason of the absence of foliage from the hill, and across the valley is the Lutheran church which protests, but frowns not, but they beckon kindly to each other, for the people live in peace and amity.

The people of eastern Iowa and elsewhere are just beginning to awaken to the priceless little gem in our midst and it is ever to be hoped that care and foresight will preserve this historical antique from vandalism and the restlessness of modern day methods.

St. Donatus or Tete des Morts village should be preserved and not allowed some few years hence to be merely a myth or a memory.

It is historical ground where Hennepin, La Salle, La Motte, La Fevre and other white men first set foot on Iowa soil—the home of Iowa's first white settlers, the burial ground of the Winnebagoes, a tribe only mentioned now, but once a large nation. Many of the marks and monuments are distinctly visible at this time, the home of Potosi and Peosta and a few Black Hawks forming a retreat and hiding place when pursued and hounded by the whites.

It is lavishly aided by nature with a vast and changing variety of scenery, rocks, hills, springs, creeks, valleys and rivers which ever preserve their originality and are not subject to duplications.

It is ever to be regretted that Longfellow overlooked this treasure ground and failed to immortalize it, so rich in tradition and history and attraction, and given preference to many other places not nearly as historical or attractive or by nature beautiful.

PARK SITES ALONG UPPER DES MOINES VALLEY.

By James H. Lees, Geologist.

At a time when the establishment of state parks is a prominent subject of discussion among lovers of nature and those who are interested in the conservation and improvement of our resources, both tangible and intangible, it is natural that attention be directed toward the central and chief watercourse of the state in the search for suitable sites for recreation centers. So the question arises as to the possibilities for locating parks, state, district, or county, along the valley of Des Moines river. A

number of years ago the writer enjoyed the opportunity of making a study of the physical features of Des Moines valley for the Iowa Geological Survey and from the observations then made the following notes are drawn.

It is evident to one who is at all familiar with the region that there is an abundance of localities along this valley which are well adapted to conversion into parks or which could with some care and effort be transformed into excellent pleasure grounds. The chief question in the matter of location, perhaps, is that of establishing such parks where they will be conveniently accessible, not only to the automobile owner, he can go anywhere, but also to the large group of people, even in our own state, who are less favored in the matter of transportation facilities. However, there are in the vicinity of most of the cities and towns along the river, areas, large or small, which are adapted for park making.

The east fork of the Des Moines river, owing to its character, has fewer potential park sites than has the west fork. In the first place it is smaller and hence has a narrower, shallower valley, which is nowhere, except in the lower few miles, cut to rock. Then more of the surrounding land is level prairie and does not offer the diversity of landscape which is present along some parts of the west fork. Nevertheless there are a number of really picturesque localities which are deserving of mention.

In Minnesota the east fork is a small stream a few miles in length which flows into Alton Lake, known also as the Inlet. This in turn empties by a channel a mile or so long into Tuttle Lake, which is crossed by the state line. Tuttle Lake covers about four square miles and on the south shore has several attractive areas which while not high above the water are well wooded and make desirable camp and cottage sites. These areas would make an excellent park and should be purchased by the state for public use.

While Iowa Lake is not strictly tributary to the Des Moines it is so near by that mention may be made of it here. It also lies on the state line, five miles east of Tuttle Lake, and its outlet is to the east toward Blue Earth river. Iowa Lake is of interest geologically because it is at the southern end of a series, known as the Chain Lakes, which occupy part of a former river valley of considerable size which seems to have drained southward during preglacial or interglacial times. Silver Lake, the next one to the north, is more popular as a resort, as it is deeper and the banks are higher. However, Iowa Lake has a charming shore line and offers a very desirable site for a state park, which should by all means be established at an early date. Iowa has all too few lakes and any which have such natural beauty as Iowa Lake should be made available to all. The State Highway Commission in its report on Iowa lakes recommends the buying of park sites at both Tuttle and Iowa lakes.

For a number of miles below Tuttle Lake the Des Moines valley is for the most part shallow and its walls are gentle and bare of timber. But east of Burt it unites with an interglacial valley, known as Union Slough, and below this point it is deeper, its walls are steeper, and grooves of timber add touches of beauty to its vistas. At and immediately below Algona the east wall is rugged and tree covered and here should be a most desirable park site which now is used only for occasional picnics or for cow pastures. This condition extends all the way to Irvington, five

or six miles to the south, so that attractive spots are present in abundance. At Livermore again, steep bluffs, timber covered, a fairly wide bottom land, and bordering prairie make a very pleasing combination of natural features. Another likely spot for park purposes is in the vicinity of Dakota, where the forks of the river come together. South of the village a long, high ridge, well timber covered and with fairly steep slopes and flat top, separates the two valleys and would afford a beautiful park location. Some small outcroppings of the bedrock add to the scientific interest of the region.

The west fork stretches a hundred miles across southwestern Minnesota before it reaches Iowa. Hence it is a fair sized stream in a goodly valley where it crosses the state line. The first locality on the Iowa side which is especially desirable for park purposes, is near Estherville. The east bluff just north of town is fairly steep and well wooded and below town the west wall is quite rugged and is heavily timbered. It seems that along much of its length in Emmet county the west wall of the valley formed the eastern margin of a belt of rough glacial morainic country. This condition, aided by post-glacial erosion of the valley wall, has made for exceedingly picturesque scenery, which should be preserved for all time. Beyond the distance of a mile or two below town the timber is scattering and for many miles the walls are nearly treeless, except in sheltered spots. In Palo Alto county, too, the belt of rough country leaves the river, hence the valley is shallow and the slopes are gentle. At Emmetsburg, however, art is assisting nature in making a beauty spot of a long, narrow, rather shallow pool known as Medium Lake, around whose southern end the town has grown. This already is a credit to the foresight of the townspeople and is destined to be of increasing beauty and utility.

Just above Bradgate, at the western edge of Humboldt county, the river, which has been following a postglacial valley, enters an older, interglacial watercourse. This is deeper and is bounded by steeper walls than the younger valley, hence attractive points and beauty spots are more abundant. Just south of Bradgate the steep bluff is clothed for a mile with a fringe of timber which with care would make a pretty spot and which is easy of access from the town. At Humboldt again the bluff rises sixty or seventy feet above the rocky channel, reminding one, to use President Macbride's phrase, of "some New England mountain channel, rather than the quiet creeping river of the level prairie." This bluff also is well timbered and makes a most picturesque scene. Just above Humboldt a dam recently constructed has made an artificial lake which will add to the assets of the region. Below Humboldt is the long, narrow ridge between the river forks which already has been mentioned. From the junction of the forks to Fort Dodge, however, the east side of the valley affords almost every desideratum for pleasure grounds—steep bluffs, high, level bottom lands, vertical rock scarps, a shelter of timber, an artificial lake behind a high dam, in fact, about all that could be desired. Below Fort Dodge the valley of Two Mile Creek, along which the inter-urban extends, may be mentioned as a typical valley for this region. The unique deposit of gypsum, for which Fort Dodge is famous, forms cliffs and scarps, and timber fills the little valley through which the singing stream

winds its way to the great river. A multitude of similar valleys make spots of local interest and charm and the main valley as well with its alternating wooded slopes and sandstone cliffs forms a picture hard to excel in all the plains country. From Fort Dodge to Boone the river is winding its course through piles of glacial debris which are heaped in ever heightening magnitude to their culmination in the Gary moraine near Frase, where they rise two hundred and sixty feet above the stream which flows by their feet. One of the most magnificent stretches of scenery along the river lies between Fraser and Boone, where the interurban skirts the wall from the river bridge just below Fraser to where it finally reaches the upland above Boone. The winding river flowing between its high walls, here bare and boulder strewn, there clothed with forest from water's edge to summit, makes a picture which once seen will never be forgotten, whether the picture be tinted with the glorious green of summer or with the glowing and variegated colors of autumn. Some enterprising soul has established a little amusement park in the nook between river and bluff close to the bridge by which the interurban crosses the river. This is only a suggestion of the latent possibilities of the region.

The locality known through central Iowa as The Ledges, a few miles below Moingona, in the little valley of Peese Creek, offers another opportunity for the locating of a public park of rare charm and attractiveness. The massive sandstone walls, vertical or overhanging, with their fringe of verdure, are in striking contrast with the smooth slopes above Boone, but are equally gratifying to the esthetic sense, and the spot has long enjoyed the favor of campers and pleasure seekers from miles about.

Between Boone and Des Moines the entire stretch of valley is a natural park and it is difficult to choose a locality for preferment. The long, narrow ridge which separates Des Moines and Beaver valleys is already in part a national reservation and it would be well to have even more of the river bluff and adjacent bottom lands included, from the point of view of park making, at least. The wide valley of the Beaver, together with the broad river flats opposite its mouth, is of geologic interest from the fact that it represents the original valley of the Des Moines. A spot which has always held a fascination for the writer is the south bluff of Des Moines valley directly opposite the state house. A smooth rounded slope with a few trees and a picturesque old farmstead stands out amid the surrounding timber land like one of nature's own pleasure grounds and offers a perpetual appeal to "come across."

Another point which is of interest as a geologic phenomenon as well as for its scenic attractiveness is Red Rock bluff, near the village of Red Rock, about thirty miles below Des Moines. The wall of red sandstone which gives its name of the locality rises high above the river and overlooks the broad and fertile valley which separates it from the frowning bluff beyond. Mention might also be made of three high ridges between Harvey and Tracy which stand like sentinels guarding the broad valley at their feet. They are separated from the uplands behind them by a broad sag which has furnished a natural route for the railways which connect the villages near them. They would afford excellent park sites to the

pleasure seekers as well as a continual problem regarding their origin, to the more thoughtfully disposed.

It may seem like reversing the laws of nature to state that Des Moines valley is not so deep below Des Moines as it is above Boone, but such is the case and this fact, coupled with the greater age of this lower portion, accounts for the longer, gentler slopes and less rugged character of the valley. However, this is partly counteracted by the increased number of outcroppings of resistant bedrock, which afford here and there picturesque scarps and cliffs of pleasing aspect. One of the more notable of these localities is that at Cliffland, between Ottumwa and Eldon. The great vertical wall of sandstone which rises sheer above the flat valley offers with its timber covering a most attractive scene in our land of fields and prairies. Below Eldon the limestones rise high in the hills, and their rugged walls gleaming from out their forest cloak or standing green with the moss of ages make pictures which will hang long on memory's chamber walls. The vicinity of the great "oxbow" in the valley at Keosauqua offers one of the best examples of this type of scene. Near Kilbourn at the upper extremity of the great bend, below Mount Zion, at the lower limb, and at various places around the loop these mural escarpments stand at the valley's margin as centers of natural beauty. Similar conditions prevail in the vicinity of those bits of rare antique, Bentonsport and Bonaparte, which lie between Keosauqua and Farmington. These different towns offer another sort of interest in that they were sites of the early attempts by means of locks and dams to improve river navigation. Some of the old lock walls at Keosauqua are yet standing in fairly good repair. Just below Croton another massive cliff rises straight from the river's edge, bearing aloft its crown of foliage and affording the traveler another of those gems of quiet beauty which make this part of the valley so attractive. An old-time ferry will carry the visitor from Croton to Athens on the Missouri side and will add the spice of variety to the perspective of valley and bluff and forest which he may there gain. In the vicinity of Keokuk, too, the city which is built upon a hill, with its beautiful outlook over the Des Moines, the river road, on one side, and over the great Father of Waters on the other, there are abundant localities which would lend themselves delightfully to the dreams and plans of the park maker. Such a spot is that one well named Buena Vista, about three miles west of Keokuk, where the Des Moines mingles its waters with the great flood of the master stream. Here are rocky hills and forest-filled valleys and geode-bearing shales to attract the curious, and here too is the east wall of a half buried abandoned gorge of Mississippi river which stretches northward to Burlington and whose width reaches westward to San Prairie (Vincennes) and St. Francisville on the Missouri side, eight miles as the crow flies. No rock shows its face in this interval, only sand and clay, which have been fashioned by rains and rushing waters into gullies and miniature gorges, fine examples of the activity of nature's agencies.

The foregoing sketches will, it is hoped, have demonstrated the truthfulness of the statement made earlier, that Des Moines valley offers abundance of sites for public parks and well merits the attention and interest of all who are concerned, from whatever point of view, in perpetuating the natural beauties of our state. What is needed is intelligent co-

operation among all who have it in their power to see that Iowa remains in deed and in truth what her first citizens called her—Beautiful Land.—Iowa Conservation, Vol. I, No. 4, p. 63.

THE MONKEY MOUNTAIN AREA NEAR OTTUMWA.

By L. H. Pammel, Botanist.

The Monkey Mountain area is well known to the people of Ottumwa. From the top of this eminence one gets a broad sweep of the valley of the Des Moines, the city not far distant and the hills on the opposite side of the river. One has indeed a rare view from the hill. The portion towards the bottom has some exposures of the coal measure sandstone. Fine narrow valleys drain towards the Des Moines. These are mostly wooded. The steep slope of Monkey Mountain itself towards the river is covered with young growth of white, black, bur, quercitron and shingle oak, basswood, choke cherry, black cherry, slippery and American elm, basswood, white ash, hop horn beam, red bud, honey locust and coffee bean, on the lower slope sycamore, river birch, cottonwood, black willow, almond leaved willow. There are numerous interesting herbaceous plants like the blue and yellow violet, mandrake, bloodroot, blue larkspur, columbine, New Jersey tea, silky cornel (*Cornus asperifolia*) hazel, buck bush, (*Symphoricarpos orbiculatus*), rose (*Rosa blanda*), prairie willow (*Salix humilis*). The region is interesting from a scenic standpoint as well as the historic because of the fine Indian mounds on the top of the hill.

This region should, of course, in time be acquired. It is contiguous to the thriving city of Ottumwa and with the modern automobile, is accessible in a few minutes.

I have known the state for many years, but I am astonished at the number of interesting beauty spots in Iowa and especially along the Des Moines.

LOWER DES MOINES.

The following is from a letter from Chas. A. Wellman:

"I have just been talking to a few of the leading citizens here about a well located rough tract of land, which is commonly known here as 'Monkey Mountain.' This land lies along the south bank of the Des Moines river about three miles below Ottumwa, in sections 9 and 15, Keokuk township, Wapello county.

"Along in 1910 and 1911, the war department caused the Des Moines river to be surveyed, Major Meigs was in charge, and he went upon this beautiful hill and said it was one of the prettiest views he had ever seen in Iowa. There is a rising bank, fully a hundred feet high, and a view of ten miles, where the Des Moines river bends, with the fertile valley across the river, crops, magnificent farm buildings, and in a distance the city of Ottumwa. At the foot of this high bank is a good beach.

"I am of the opinion that if we could get the state to acquire this land, which may be some two hundred acres, and as much more as may be needed. It is cheap land and it is my opinion that it can be bought on an average of \$50 an acre, and possibly less.

"We would like to get the state interested in looking over this ground and get something started before the owners find out anything about what the purpose is, so that they would not inflate the price.

"Will you please be kind enough to advise me in the premises? It is my opinion that we could arrange a drive, and later on a boulevard between this land and Ottumwa, and make use of it immediately."

STONE PARK, SIOUX CITY.

By E. A. Burgess.

I heartily concur in the suggestion that a number of fair sized parks, located in different parts of the state, would serve the public interests better than a single large park. In that connection in my judgment, Stone Park, in Sioux City, by making additions up and down the river, and extending the park further eastward, making it embrace some 3,000 acres of land, is an admirable location for a state park. As a natural preserve for birds and animal life, and plant life, it has unusual features to recommend it. The necessary adjoining land could also be obtained at a reasonable price, and I am certain that arrangements could be made with the city to bring about such a result. There are some half dozen localities in the state which are peculiarly adapted for state park purposes, and I regard Stone Park as having advantages for such purposes not excelled by any of these other localities.

OCHEYEDAN MOUND, OSCEOLA COUNTY.

By George F. Kay, Geologist.

Among the many interesting surface features of Iowa, there are few, if any, that have attracted more attention or have excited more wonder than Ocheyedan Mound, which is thought by many persons to be the most remarkable and beautiful hill in all northwestern Iowa. It lies within a region of varied topographic features, including lakes, ponds and marshes, level prairies with fine farms, and precipitous hills, some of which are in groups with no distinctive arrangement, while others, perhaps best illustrated by Ocheyedan mound, are isolated and rise somewhat abruptly above their level surroundings.

The mound is about one and one-third miles southeast of the town of Ocheyedan, in Osceola county, its summit is about one hundred and seventy feet above the flood plain of Ocheyedan river, which is a short distance to the west of the mound. It is, moreover, one of the high points in Iowa, its elevation being about 1,570 feet above sea level. The general trend of

the mound is northeast-southwest, in which direction its extreme length is about one-third of a mile. Its width is narrow compared with its length; in places along its summit it is only a few yards wide. The material of the mound is chiefly sand and gravel, and on its surface lie boulders of various sizes, including rocks of many kinds, among them being granites, Sioux quartzites, and limestones. From its summit there may be seen in all directions a beautiful landscape, dotted here and there with prosperous homes.

Ocheyedan mound has historic interest and has long been recognized as a conspicuous landmark in northwestern Iowa. Nicollet, who explored this region as early as 1838-1839, refers to this mound and states that the name "Ocheyedan" means "the spot where they cry," which alluded to the customs of the Indians to repair to elevated situations to weep over their dead relatives. Dr. Thomas H. Macbride, president emeritus of the University of Iowa, in a report on the geology of Osceola county, published by the Iowa Geological Survey, describes the hills of the region and refers to Ocheyedan mound as follows: "The most remarkable of all these hills, a beautiful object in itself, and by far the most elegant illustration of its type, is the long time famous Ocheyedan mound."

The mound is a kame, which signifies that it is of glacial origin. Kames are hills and ridges of stratified drift deposited in connection with glaciers at the mouths of ice tunnels or ice channels and in re-entrant angles of the edge of the ice. They are associated in many places with unstratified drift deposited at the terminus of a glacier, or at its edge, while it was retreating. Ocheyedan mound was formed during the recession of the Wisconsin ice sheet, which invaded our state many thousands of years ago.

The esthetic value of such beautiful and interesting geological phenomena as Ocheyedan mound should be fully appreciated by the citizens of the state, and every effort should be made to prevent their destruction. Already Ocheyedan mound has been somewhat marred by the removal at its summit of sand and gravel which was used for commercial purposes. To be sure, the mound is valuable for the many tons of material that might be taken from it to be used for road-making or other purposes, but of far greater value is it to the state as a beauty spot, a landmark, which should be conserved for future generations just as zealously as we are wont to conserve our material resources.—Iowa Academy of Science, Vol. XXIV, pp. 101-2.

DES MOINES BLUFFS IN MAHASKA COUNTY.

By L. H. Pammei, Botanist.

The sandstone bluffs of the coal measure type are well known to the people of this vicinity. This region was formerly much used for picnic purposes. It is on the Cedar creek which empties into the Des Moines a few miles below the large mass of sandstone rocks near the mouth of the Cedar creek which is just above the old town of Rochester. Some of

the old buildings of the town of Rochester are now being used by summer resorters. There are at least a half dozen cottages belonging to people from Oskaloosa, who make use of the water of the Des Moines and the Cedar rivers and the Des Moines bluffs for an outing. From the highest points on these bluffs one can see the Des Moines valley and get a good view of the hills on the opposite side of the stream. The rocks facing the river are in some instances nearly 100 feet high and the hills have been cut by gorges, one of which is nearly a half a mile long, with sandstone cliffs on each side. There are at least five of these canyons. The mouths of some of the larger are from three to four hundred feet wide and the smaller from twenty-five to thirty, while still others are only about fifteen feet across. In the little valleys a large variety of plants are to be found like the butternut, black walnut, hard maple, honey locust, hackberry, almond leaved willow, black willow, green ash, white ash, while the slopes are covered with the same type of plants, except the willows. You also find an abundance of hophorn beam, service berry, choke cherry, black cherry, white oak, some of the sandstone rocks are nearly devoid of any vegetation except the reindeer lichen and several species of moss. On the shady side of the rocks were found two or three of the rarer species of ferns in the state, namely (*Aspidium Goldianum*), a variety of *Aspidium spinulosum*, two species of bladder ferns, (*Cypstoperis bulbifera*, *C. fragalis*), *Woodsia*, *Asplenium Filix-foemina*, the walking leaf fern (*Camptosorus*), *Polypody*, (*Polypodium vulgare*), maiden hair fern, flowering fern (*Osmunda claytoniana*). In point of species there are nearly as many ferns in this region as there are in the Wild Cat Den region at Muscatine. It certainly is gratifying that the people of this region have protected the area and that so little destruction has occurred.

There are also many interesting herbaceous plants like *Mitella diphylla*, touch-me-not (*Impatiens pallida*), sanicle, avens, everlasting columbine, dutchman's breeches, spring beauty, mandrake, sweet williams, etc., also such shrubs as cornel, hazel, buck bush, etc.

From a scientific aspect this area is well worth preserving, and should be included in our general scheme for parks. I am told that the land can be had at a reasonable rate and the people of Oskaloosa are making efforts to have this set aside for a state park.

LITTLE WALL LAKE, HAMILTON COUNTY.

By James H. Lees, Geologist.

Little Wall Lake is one of the most southern of the lakes of the Wisconsin drift plain and indeed lies at the margin of the lake region of north central Iowa. The nearest lake of any value as a pleasure resort is Wall lake in Wright county, which is twenty-three miles to the north. There are no lakes to the east or south and westward the nearest and only lakes are Twin lakes in Calhoun county and Wall lake in Sac county, each about seventy miles away. It will be clear then that Little Wall lake can have no competition as a pleasure resort, nor is there any other which can take its place.

Professor Macbride in describing this lake used the following language: "Little Wall lake, south of Cairo lake three or four miles, is a picturesque little pond, half a mile wide and a mile or more long, nearly surrounded by steep, wall-like hills. Had it depth Little Wall lake would be the attraction of the landscape, but its shallowness makes it simply a great marsh filled from side to side with aquatic plants. The margins are dark with sedges. In the middle the cat-tail lifts its blades undisturbed while over the deeper waters the pond lillies spread their broad leaves like inverted shields and star the surface with flowers. Innumerable birds fill the air with strident, unmusical sounds; ducks steer their miniature fleets about; mud hens wade among the calamus roots; blackbirds cry as if life depended upon unceasing noise; the tern hovers above the more open waters or sit upon the sand as if by sea; the bittern sits among the reeds, bill straight up, more like an inverted stake than any stake-driver; and over all, in the evening, clouds of insects—mosquitoes make gray the air on every side. For the rest, boulders now are few; occasionally a big one lies on the shore tumbled down by the undermining of the waves, here and there sufficient when the lake is full, to beat against the steeper shores. In the earlier morning the mists from the waters screen from the traveler the beautiful grain covered hills that slope down on every side and the lake lies in primitive wildness, an isolated reminder of the wierd marshy topography that so recently characterized not these counties only, but all northwestern Iowa, the land of a thousand lakes."—(Iowa Geological Survey, Vol. X, pp. 117-8.)

A report made about eight years later by the Iowa Highway Commission, while more technical, is in the same tone and gives a similar impression regarding the value of the lake. This report says:

"Little Wall lake is situated in sections 9, 10, 15 and 16 of township 86 north, range 24 west. It is most easily reached by driving three miles south of Jewell Junction. The highway leads directly to the lake and skirts its western shore. Webster City is twenty-two miles to the northwest, Iowa Falls thirty-four miles to the northeast. The nearest lake is Big Wall Lake in Wright county, which is twenty-three miles due north.

"This lake is not prepossessing on first sight, due largely to the fact that a large part of the surface is grown up to rushes. The banks, however, are good and on the east side considerable natural timber is found. In several places around the shores typical walls pushed up by the ice are to be seen. These seem to show that at some time in the past the water level was considerably above where it is at present. Scarcely any low land which cannot be drained is to be found near the lake.

"The water varies in depth from three feet in the northwest part of the lake to six feet in the southeastern part.

"The area now is 230 acres. The area enclosed by the meander is 273 acres. The water shed is very small.

"At the present time the lake is more of a hunting resort than anything else. A hunting lodge is maintained on the west side, and several boats are to be seen along the lake shores. It is reported that fair strings of bullheads are taken from its waters.

"The water supply is not all that can be desired. The tributary area so far as surface drainage is concerned is so meager as to make one wonder why there is a lake at all. It seems probable that this lake, like some others, must receive part of its water by a gradual infiltration from the gravels of the glacial drift on which it lies. It is reported to have gone dry as did many of the lakes of the state in 1894. During most years, however, there is water there.

"A low place in the bank on the southeast side of the lake is the natural outlet. This leads away to the southeast and empties into the Skunk river. The water in the lake is nearly three feet lower than the outlet.

"In the northern part of the lake the bottom is of silt. In the southern and eastern parts considerable sand and gravel are found.

"People in the vicinity are in favor of keeping the lake and they wish very much to see it improved."

After an inspection of the map which accompanies this report and a perusal of the documents, it seems that it is the part of wisdom to retain this lake and make it more useful to the people of this part of the state. Iowa has enough good farm land so that she can well afford to retain this small area for pleasurable and aesthetic purposes. This argument is strengthened by the lack of similar localities nearby. The map shows that in places the shores are high enough to furnish good camping or cottage sites and their beauty can be enhanced by judicious forestation. Water sites have an attraction for all but the most sordid, and this natural and laudable craving should be given means of gratification whenever and wherever possible.

MONTGOMERY COUNTY.

Montgomery county, like other counties in southwestern Iowa, has nothing in the way of recreation places. The streams of this county contain a considerable quantity of timber. The land along these streams is of little agricultural value because subject to frequent overflows. Every rain causes the water to go out of the banks of the stream, depositing mud and silt over the land. Mr. Gordon Hayes states that this land, for agricultural purposes, is not worth more than \$25.00 or \$30.00 per acre. There are fine bur oak, walnut, American elms and cottonwoods on these bottom lands. Perhaps there are few areas in Iowa where black walnut will grow better than in the bottoms of the Nishnabotna. The state might well buy a small area for experimental purposes. The black walnut timber is sure to be of great value in the future for the construction of aeroplanes. The profitable holding of such lands to grow walnut for commercial purposes cannot be done by the private individual and is a matter for the state and nation to undertake. Such areas have great scientific value, but its use for recreational purposes is unsuited, owing to the deposit of silt and mud. There are, however, areas in this and other counties where woods occur along the highways which are well suited for park purposes. Such occur along the proposed military road that goes through Red Oak and Glenwood. The state might acquire small tracts of wooded

areas, 50 acres along the smaller streams in the hills, which would give persons who now use the highway, opportunity to spend a few restful hours in the shade of these trees. In many cases persons are warned not to trespass or picnic on these grounds. Where can the boy or girl go to have a good time in the country? There is a tract of land south of Red Oak in the Nyman region of about 160 acres accessible to the people of Shenandoah, Red Oak and Clarinda, which, according to Dr Morris and Mr. Hayes, would make an ideal place for a state park, because easily accessible to the people of these places. This was not viewed by us. A man's or woman's reminiscence ever goes back to the days of childhood. These are among our priceless memories.

It seems to me that for regions like Montgomery county and regions like it in southwestern Iowa, the proper thing to do is to acquire smaller areas along highways. That we should have a number of such parks well distributed in southwestern Iowa in addition to the larger area in Fremont and Mills counties.

DES MOINES RIVER BLUFFS NEAR LEIGHTON.

By Lacey F. Rickey.

Prof. Pammel asked me a few days ago to contribute an article on the Des Moines river bluffs near the old town of Bellefontaine. I expected at the time to be able to get a little more information concerning this beauty spot, but for lack of time, I will have to write simply a short sketch from the knowledge of these bluffs that I now possess.

These bluffs rise to a height of probably two hundred feet, having in places a sheer drop of one hundred feet or more. It is by far the most picturesque spot in this section of the state. The slopes are covered with a dense growth of all kinds of native trees while numerous varieties of wild flowers grow in their shade. In the autumn, when nature changes the somber green foliage of the trees to a riot of reds and yellows, it is truly an enchanting place, and presents a picture which is not soon forgotten.

There is a small cave here, which so far as I can find, has never been thoroughly investigated. It is supposed, by those living in the neighborhood to be the haunt of various kinds of animals. Rattlesnakes are frequently found among the rocks, and probably other fauna, practically extinct over the greater part of Iowa, still make their home here.

The boyhood home of the late Major John F. Lacey adjoined the bluffs, and it was from this home that he went to take part in the great Civil War. Probably a great part of his never-tiring love of nature and of the birds especially, sprung from his association with them here at the bluffs.

In the early days the bluffs were a meeting place for the surrounding country for miles and miles. Political meetings, revivals, and celebrations of various kind were held here. As the towns grew, the meeting places naturally went to them, and the bluffs were again left in charge of Mother Nature.

At one time the course of the river passed at the foot of the cliffs, but a flood, in the early '50's I believe, caused a cut off, leaving the bluffs fully half a mile from the new course. The river has been rapidly eating its way back, and a few more high waters will bring it back to the old course at the lower end of the bluffs.

The place is well known locally simply as "The Bluffs." It is situated on the south side of the Des Moines river, between Knoxville and Oskaloosa. The Tracey-Oskaloosa branch of the C. B. & Q. railroad crossed the river a short way from the bluffs; Tracey being the nearest regular station.

The bluffs lie about three miles below the early day town of Bellefontaine, which if I have my history straight, lacked only one vote of being the first capital of Iowa. The town is now merely a memory. About a mile below the bluffs but on the other side of the river, was another pioneer town called Rochester. These towns witnessed the early navigation of the Des Moines, and later saw the growth of the cities more favorably located on the railroads, giving way to them in the development of the country.

These bluffs are locally known as a beautiful place where nature has been left to have her way. They are well located and should be investigated as a park site on the proposed road along the Des Moines river.

DES MOINES RIVER BLUFFS STATE PARK.

By Mrs. Carol Sawyer.

There is a 300 acre farm owned by Robert W. Campbell, on the Des Moines river, about 13 miles from Oskaloosa, Mahaska county. The "Bluffs," as the place is commonly known, comprises about one-half of this farm. Their highest point is about 300 feet above the river. There is a fine timber, most of it virgin timber, white oak, elm, red oak, hickory, butternut and a few old sycamores. There are an abundance of wild flowers, moss and ferns of all kinds. Not much underbrush, and plenty of blue grass. Cedar Creek curves around the bluffs about a quarter of a mile from the river, outlining the proposed park.

It is a splendid location for a game preserve. There are coons and other native animals and some fox dens on the place. The rock is sandstone. The site is located on a good county road between Oskaloosa and Bussey, and easy of access to the road. It is about a mile to the bluffs proper, with no ravines to cross, and a half mile from the road to the timber.

The old stage road that paralleled the river from Burlington to Des Moines is opposite the Bluffs. A little above is Bellefontaine, one of the early settlements, which made claim for the state capitol. Opposite the bluffs was Rochester, a stopping place for the stages, and also possessed the steamboat landing. Many of the farms along the river were laid out before the country was surveyed, and have the same boundary lines at present, as the old claims.

RED ROCK, MARION COUNTY.

By W. H. H. Barker.

I am and have been for years interested in public parks. Note your (Dr. Pammel's) second visit to Marion county, in the interest of these parks. I have been in Iowa for over three score years. Have been in every county of the state save two, and covered a good part of the terrain in all these counties. Just above McGregor, Clayton county, bordering the Mississippi river, is a plot—ideal in my estimation—for one of these parks. Another is located in Marion county on the south side of the Des Moines river, some miles below the village of Red Rock at a point where a high bluff juts abruptly against this stream. Personally I have made nine trips by boat down the stream in the last ten years, from Des Moines to Harvey and Ottumwa, noting specially its scenery. On account of the overflow, so frequent on this stream, no bottom land should be considered in any respect.

THE RED ROCK REGION.

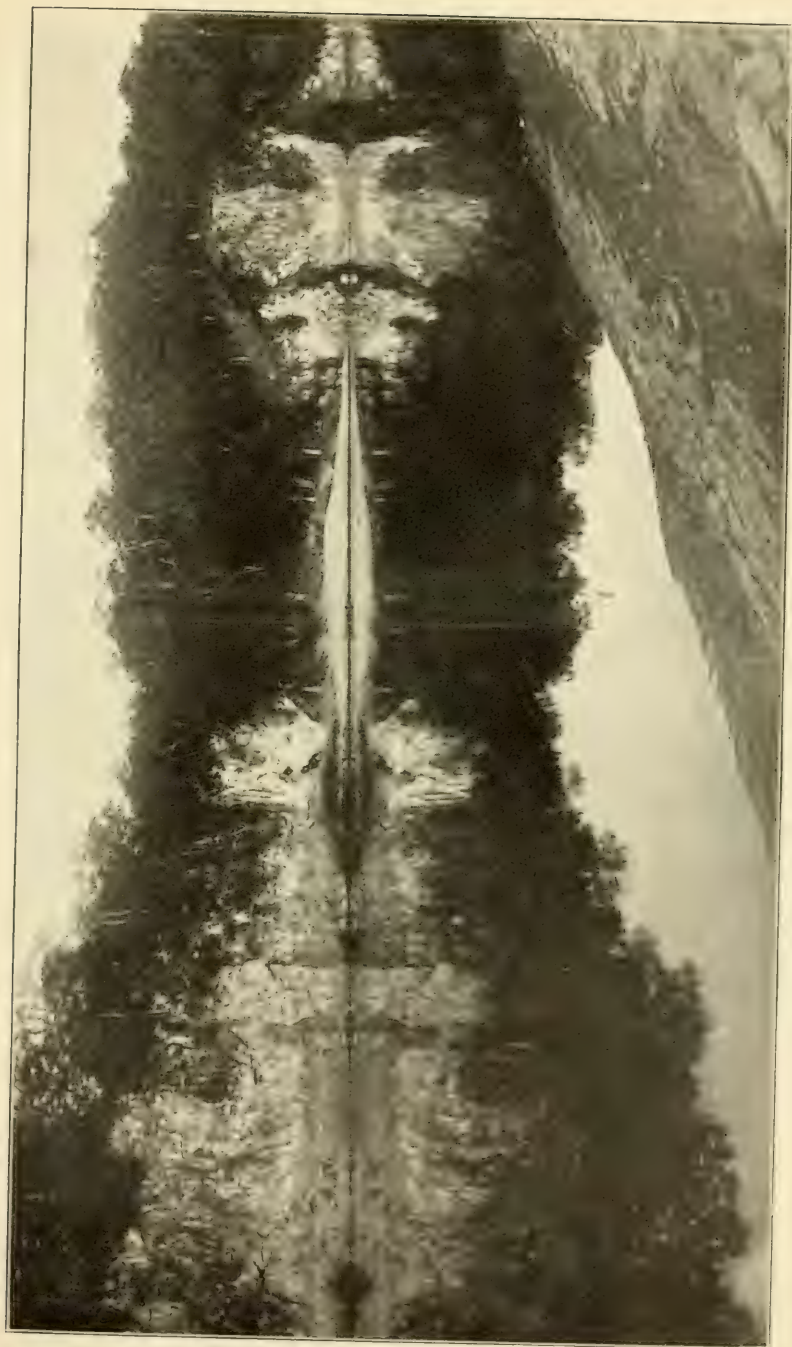
By E. R. Harlan, Curator Iowa Historical Department.

Ascending the Des Moines valley through Wapello and Mahaska counties there are numerous points of surprising scenic beauty. There are many of historical and scientific interest, and for the most part, all have a sufficient recreational value to warrant its reservation for the perpetual use of the people.

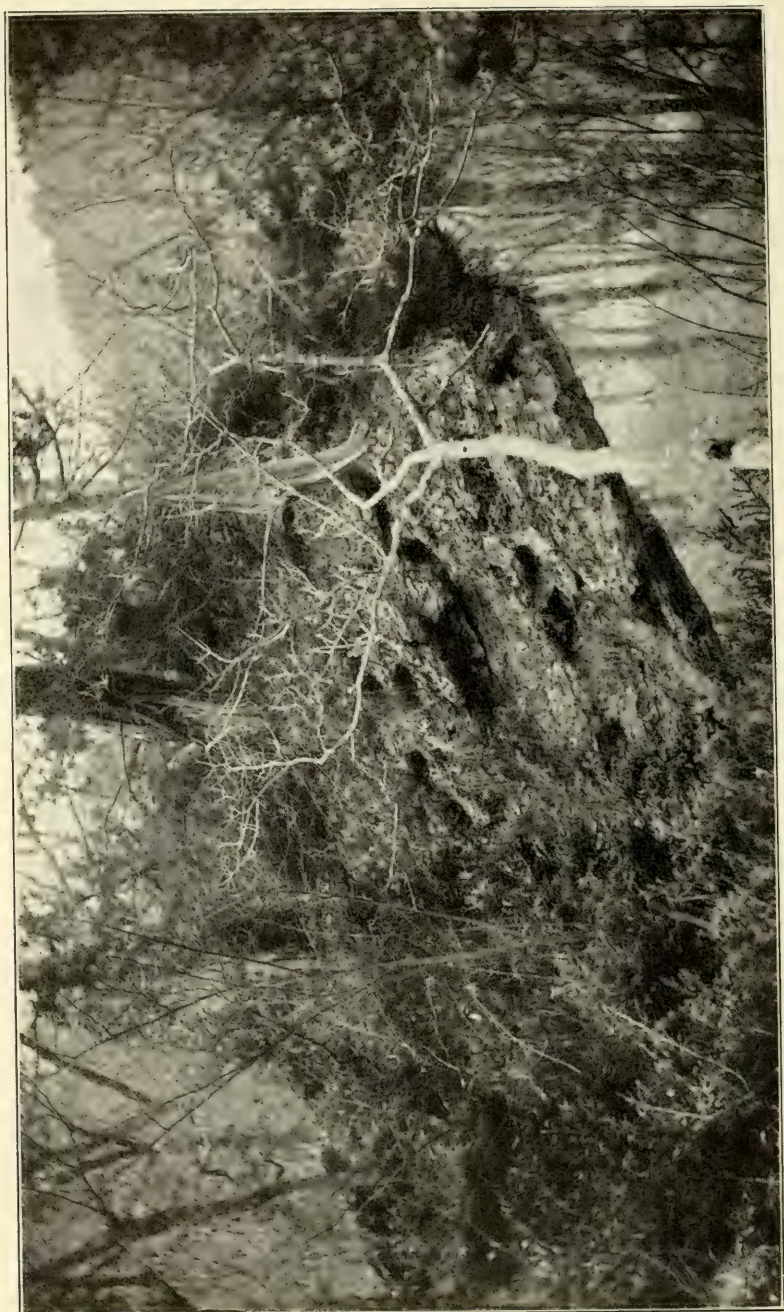
The Red Rock region in Marion county, however, exceeds all the others in its combined and separate qualities suited for recreation or resort by every type of mind and purpose.

In preglacial times a north and south ridge of sandstone had been created, so thoroughly impregnated with iron oxide that it is of every shade or color from vivid vermilion to soft light salmon and tawny yellow or buff. It is of a thickness of a hundred feet or more. The Des Moines river has cut its way through this ridge and employed the ages in wearing away its sides forming bluffs and ledges of 60 to 80 feet in height. These are swept by the present current at their feet or there are stretches of low bottom lands, some timbered, spreading out and across the valley. The timber lands still afford exquisite primeval areas, and some individual specimens of the original trees. One is sycamore, being of the immense girth of 27 feet at five feet above the ground.

Where creeks put into the river, canons are formed running back from the river up the streams in varying distances, but carrying the uniform interest to the geologist, botanist and forester, while the archeologist finds upon the ridges created by these lateral streams, without a single exception only where the plow has been at work, the prehistoric mound builders structures. The red sandstone, and certain coal strata underlying, were inducements for the late Jay Gould of New York and Jefferson S. Polk of Iowa, to construct the Des Moines branch of the



Limestone Cliffs, Palisades, Cedar River, Linn County.



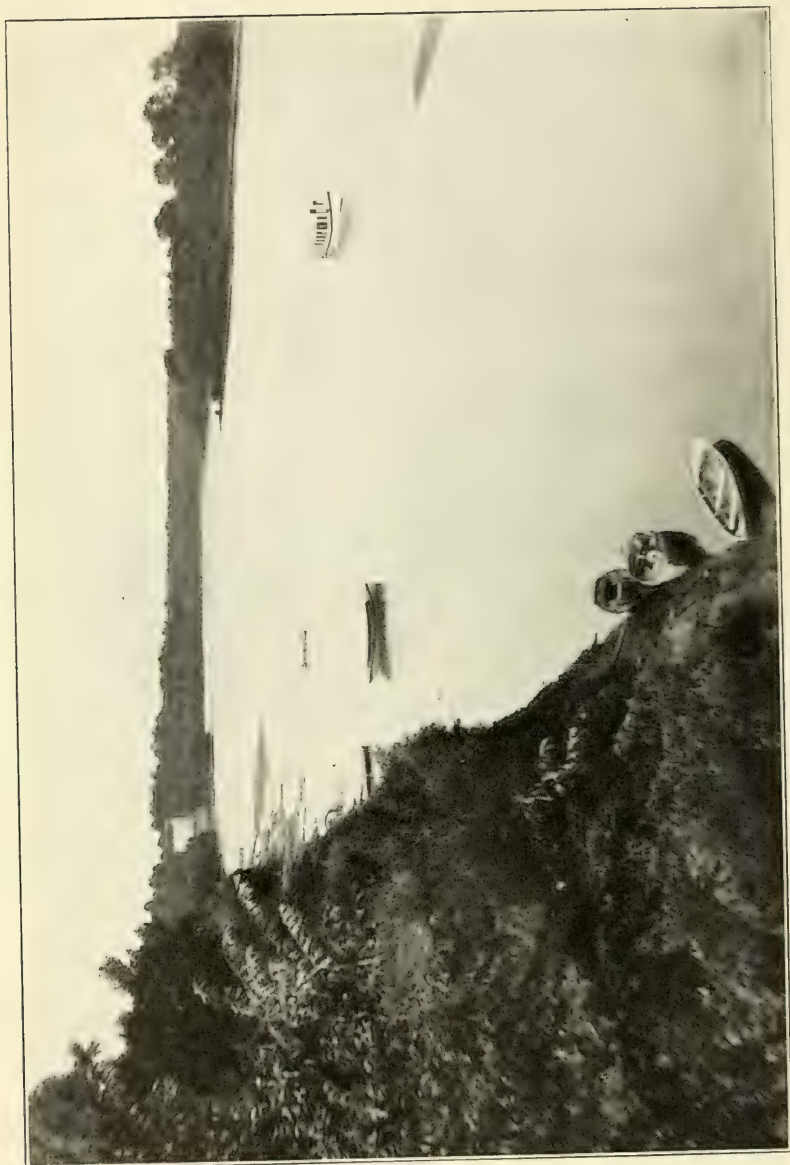
Balanced Rock, Bixby Park, Clayton County.



Isopyrum, Iowa Falls.



Ninebark, Woodman's Hollow, Webster County.



Des Moines River in Keosauqua Park.



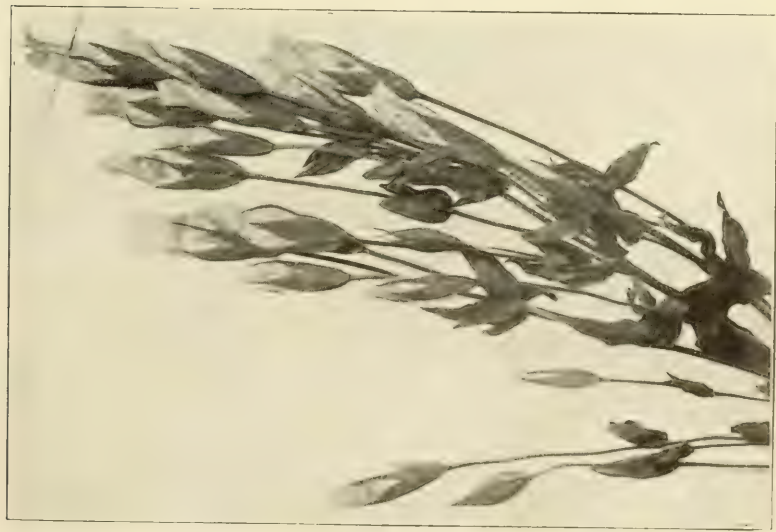
Prairie Clover.



Closed Gentian, Linn County.



Lotus in Farmington Park.



Fringed Gentian (Found in Bogs), Cerro Gordo Co.



Myerholz Lake, Near Wapello.



Yellow River, Allamakee County.

Wabash railroad through this region. The stone in quantities was once quarried and marketed, and is the red stone observed in structures in central Iowa cities, notably in the old J. S. Polk residence and the old Y. M. C. A. building of Des Moines.

The undisturbed original soil, partly shaded by trees and rocks, sloping respectively to the south and to the north affords an extraordinary exhibition of the original plant growth. The writer has observed and identified in their season on stream and slough, on the ground and in trees, every variety of bird he has seen nesting in Iowa timbered sections, while he has observed the nests, dens, tracks, paths and living specimens of a greater variety of game and fur bearing animals than in any other equal area.

After the Sac and Fox Indians' defeat in the Black Hawk war in 1832 and their expulsion across the Mississippi river to that region forty miles west of its west bank, they continued their permanent homes in the Des Moines or Keosauqua Sepo valley, above Eldon and below Fort Dodge. Title to this region was by them relinquished in 1842 on the insistent demand of the encroaching white home makers, government engaged to repay them for their lands by granting the Indians other lands and certain annuities. Exactly what lands should be their future homes remained, at the time of the treaty in 1842, still uncertain. But they engaged with the government that they would at once give up the eastern part of the great region if they might be left in aboriginal enjoyment of the western part. The duration of this arrangement, it was agreed, should be until the government found new homes for them elsewhere.

The Indians proposed as a boundary between the eastern portion they gave up and the western part they continued to occupy, a land mark known to white and red men alike, namely, "The Red Rock of the White Breast."

In 1843 George Harrison, for the government, met a delegation of the Indians and fixed upon a mound on one of the high red stone ledges north of the river, ran a meridian north and south from thence through the Indian country, and the Indians at once removed 'west of the Red Rocks' as agreed.

This boundary line, then, became the west boundary of the white settlement and the east limit of Indian rights of possession. The Des Moines river formed the main artery of travel and access, a settlement naturally sprang up on its banks and became the old trading town of Red Rock. To secure the Indians against encroaching white hunters and meddlers, the government established a military post among them and Lieutenant Allen and his detachment of the United States First Dragoons marched to and erected "Fort Des Moines" at "The Raccoon Forks." Here the soldiers remained—not to protect the whites and suppress the Indians, but the exact reverse. When Indian lands in the "Kansas country" were decided upon for these Indians, the First Dragoons gathered them out of the reaches of the country "west of the Red Rock line" and in 1846 marched away bag and baggage with their proteges, their cabins and the Indian lands were entered upon by the first of our white predecessors.

The Red Rocks, the town of Red Rock, the abandoned town of Rosseau which in 1849 to 1860 was the river "port" for Knoxville and other actual and proposed inland metropoli to the south, the relics of the great stone quarry, the cemetery of the old trading post and the deep trails and paths among the hills leading out to "Poweshiek's village," now to Des Moines and Colfax, all form a region of peculiarly deep and significant historical interest.

If visual pleasure and inspiration be matters for the eye alone or for that member augmented by the glass, and whether through lines of vision measured by inches or by leagues toward every point of the compass, and whether in one or others of the seasons of the year or hours of the day or night, Iowa affords no region the equal of this circle of hills so easily accessible to an equal population, if indeed at all.

Were I concerned that my name should remain esteemed throughout the future and had I my choice of means wherewith to achieve that end, I say deliberately that I would ask that of my public acts the one for remembrance is that of autographing the document that would transmit this area free from axe and fire to our most distant kin.

THE YELLOW RIVER VALLEY NORTH OF POSTVILLE.

By James H. Lees, Geologist.

Like the Oneota valley, Yellow river valley is a naturalist's paradise. From near its sources north of Postville all the way to its mouth at the Mississippi, it is bordered by increasingly high rocky bluffs which are crowned and covered with a luxuriant mantle of trees. All the lower geological formations of Iowa are represented in its walls—the Jordan sandstones, the Oneota dolomites, the St. Peter sandstones and the Galena-Platteville limestone. The whole valley is a natural park filled with interest for the geologist and the botanist and the lover of nature in all its forms.

One of the most valuable and interesting parts of the valley, from these combined standpoints, is a strip in section three of Post township, five miles north and one mile east of Postville. For a stretch of a mile the steep bluff shows a high mural escarpment of limestone buttressed by a slope of waste material. On this slope and on the upper edge of the bluff capping the limestone wall are abundant trees of the commoner varieties, but the treasure of the region, botanically speaking, is the large number of rare balsam firs which are scattered throughout the timber, from base to summit of the bluff. In several places erosion has entirely cut away the slope of waste material and has exposed the bare vertical wall of rock. At one such place a cavity has been hollowed out of the wall, like the one in which Moses was hidden (!) and from the base of another there wells out quietly but perennially a great spring whose clear waters keep an open stream throughout the year. There are said to be several other springs at the edge of the river.

YELLOW RIVER REGION IN ALLAMAKEE COUNTY.

BY L. H. PAMMEL, BOTANIST.

The area about Myron must be considered separately. With Ellison Orr and D. O. Wilson, a day was spent early this summer in an investigation of this interesting region. The area here considered is on the north slope of a hill, with the Yellow river flowing at its base. The Yellow river is a stream of considerable size, having its source from several streams from one-half to three-quarters of a mile above the place where the Balsam fir occurs. Temperature records taken of the soil one inch down at random indicated that the soil was much cooler than that of the surrounding woody hills and bluffs. The limestone rock is extremely porous and all through it are caverns of various sizes. From these caverns during the summer cold air is constantly issuing. At one point where the rock was covered with mosses, consisting of *Hypnum tamariscinum* and *Anomodon minor*, the temperature was 46 degrees F. The highest temperature found in open places was 63 degrees, at a depth of one inch. At other points the temperature varied from 56 degrees to 60 degrees, showing that one of the most important factors in connection with the boreal plants developed here is the temperature. The temperature of the air was 75 degrees.

The stretch of Balsam fir woods extends from about one-half to three-quarters of a mile on the north slope of a hill. The Balsam fir, the White pine, *Pyrus arbutifolia*, *Corylus rostrata*, *Diervilla trifida*, *Betula papyrifera*, *Lonicera glauca*, *Aralia quinquefolia*, *A. racemosa*, *Bromus purgans*, *Poa nemoralis*, *Campanula* *Taxus canadensis*, *Sambucus racemosa*, *Phegoteris calcarea*, *Acer spicatum*, *Aconitum uncinatum*, *Viola blanda*, *Saxifraga pennsylvanica* and *Arabis lyrata* were distributed throughout the region. The *Poa nemoralis*, *Arabis lyrata* and *Campanula americana* occurred upon the limestone rocks with little soil. They occurred with numerous species of lichens, of which the following are prominent: *Buellia albo-atra*, *Lecanora privigna*, *L. calcarea* var. *contorta* and *L. muralis* var. *versicolor*. The *Polypodium vulgare*, *Circaea alpina* and *Cypripedium pubescens* were more or less local. Most of the limestone rock has become covered with vegetation. It is only in the drier places that the *Arabis lyrata* thrives. The *Saxifraga pennsylvanica*, *Viola blanda* and *Bromus kalmii* occur in the moister places.

THE BACKBONE, MADISON COUNTY.

By James H. Lees, Geologist.

The Backbone, on Middle river in Madison county, is a charming bit of scenery cut out of the one time level plain of south central Iowa. It represents the erosive activity of the stream, working through many centuries and swinging in ever widening curves. It is located in sections 15 and 16 of Lincoln township, four or five miles southwest of Winter-set, from which town it is readily accessible and where it is justly

popular. Its steep rocky timber covered sides and the long smooth slope at its end, where it sinks down to the valley, afford both restful, pleasant spots for picnics and excellent vantage points for those who find delight and inspiration in the views over hill and valley.

As one goes up the river from south of Winterset he cannot fail to be impressed with the width of the valley as compared with the size of the stream which occupies it. To be sure the valley is not so large as it is farther down stream, in Warren county, where it is fully a mile across its floor. Still its width here is one-third to one-half mile and much more than that from river to river. The sides here are steeper also and show the presence of rock through most of their height. Farther upstream, however, nearer the Backbone, the valley is narrower and the south wall, at least, is quite steep. Within the loop made by the southward bend of the river is a broad high terrace, which slopes down to the river on the south.

The Backbone itself, a tongue of land nearly a mile long jutting into the northward loop of the river just to the west of this terrace, is, as its name implies, a high ridge bounded on both east and west sides by exceedingly precipitous walls. Near its middle the ridge is so narrow that there is actually only just room for the wagon trail which extends along its summit. From this trail one may see the river meandering across its valley on either hand; on one side flowing in one direction, on the other side in the opposite direction. At its northern end the Backbone broadens out and slopes gently down to the river. At the south end, it rises to the height of 140 feet above the river and here likewise it is broader and the side slopes are less precipitous. The entire ridge is rock built with only a thin veneer of soil and forest mould through which in many places the rock protrudes.

The nose of the ridge is at present almost bare of timber, except for a rare cedar or some deciduous tree which has been spared. The higher parts of the Backbone are still quite heavily timbered with oaks and elms and hickories, and an occasional white pine or cedar. Just at the crest of the ridge is a fine group of pine with one or two cedars and a few birch trees, their white bark gleaming in fine contrast through the green of the evergreens. On the west side the timber is being cut off and if this stripping process is continued it will not be long before this steep slope is bare and subject to active erosion.

At the part of the ridge where it is narrowest some enterprising soul years ago tunneled through the soft black shales which underlie the heavy upper limestone ledges and so carried the water from the river on the upstream side of the ridge to the downstream side, thus giving a head of about 12 feet to drive the wheels of his mill. Today the mill is in ruins, only a few fragments of the stone foundation walls are standing, and the tunnel serves as a short cut for cattle and as a storage room for farm implements. It is perhaps two hundred feet long and eight to ten feet high. The shales have fallen down along the walls until these are now 20 to 30 feet apart leaving a flat rock roof spanning the opening between.

On the wide outer curve of the valley the walls are steep and high. In places they are timbered from base to summit, but elsewhere they are too rocky to support a forest cover. In some places the rock ledges form straight horizontal lines across the face of the bluff, while in other places the entire slope is strewn with rock fragments, the wastage from the solid strata beneath.

The Backbone reveals a most interesting fragment of the geological history of the region, a fragment which is writ large and clear for him who would interpret its meaning. The rock strata belong to the Missouri stage of the geological column, sometimes called the Upper Coal Measures. The limestones over which the river is flowing and also those which make up the upper part of the ridge tell of quiet clear oceanic conditions, when myriads of humble types of life peopled the waters and the ocean floor. These rocks are built very largely of the shells and other hard remains of these animals of a far distant day. Between the two ledges of limestone is a layer of dark gray to black shale. This tells of a relatively brief period when the waters were more turbid and mud and silt were being carried in from nearby shores and rivers. It is through these shales that the tunnel was dug to supply water to the Tunnel Mill. Following the retreat of the ocean from the region there is a long gap in the history, a gap which extends to the Pleistocene period, the time of the advance of the great glaciers. Either in the period just preceding the Pleistocene or else in the interval between the first two ice advances, the Nebraskan and the Kansan, Middle river cut its valley in the plain. The valley was filled by detritus from the glacier and the river has been steadily engaged in clearing this out. The great size now attained shows how successful it has been. When the stream was flowing up on the level of the plain, nearly 200 feet above its present position, it began meandering and as it sank into the loose surface material and then into the rock its meanders became fixed and continued to increase by the cutting of the stream into the outer walls. In this way were formed the steep outer walls of the valley facing the Backbone, while on the inner curves were being cut the long gentle slopes at the end of the Backbone and the face of the terrace within the wide bend to the east of the Backbone.

The whole assemblage of phenomena gathered here, the long high narrow ridge, the steep walls of the valley, the rock strata with their contained fossils, the peaceful river with its flat flood plain, the variety and abundance of the plant and bird life, with their rare and unusual varieties, all of these make a grouping which renders the region of the Backbone of great value scientifically and scenically as well as from the standpoint of pure pleasure. The region is certainly well worthy of being set aside for a state park, and such action should be taken soon. Enough should be included in the reservation to insure the perpetuation of the beauty and safety of both sides of the river valley as well as of the Backbone itself.

BOTANY OF THE DEVIL'S BACKBONE AREA IN MADISON COUNTY.

By L. H. Pammel, Botanist.

The plants of the Devil's Backbone area are of special interest. The area is a wooded tract with the valley of the Loup river cutting through the area in a tortuous manner. Here and there are outcrops of limestone with narrow ridges, and xerophytic plants like the red cedar, blazing star and golden rods (*Solidago nemoralis*). The shady slopes where more soil has been accumulated, have a denser vegetation and better tree growth. On the Devil's Backbone I noticed prairie like openings shading off into the woods on the slopes.

Among the more common plants observed in the unique prairies, I may mention blue joint (*Andropogon scoparius*), blazing star (*Liatris pycnostachya*), golden rod (*Solidago rigida*, *S. nemoralis*), asters (*Aster laevis*, *A. multiflorus*), coreopsis (*Coreopsis palmata*), side oats (*Bouteloua curtipendula*), Canadian blue grass (*Poa compressa*), blue grass (*Poa pratensis*), partridge pea (*Cassia chamaecrista*), wild bean (*Strophostyles helvola*), bush clover (*Lespedeza violacea*), Psoralea (*Psoralea lanceolata*), lead plant (*Amorpha canescens*), New Jersey tea (*Ceanothus ovatus*), skull cap (*Scutellaria parvula* var *ambigua*), horse mint (*Monarda fistulosa*), mock and pennyroyal (*Hedeoma hispida*), American pennyroyal (*Hedeoma pulegioides*), is common in the woods adjacent to the prairie openings. Prairie clover (*Petalostemum violaceum* and *P. candidum*), milk vetch (*Astragalus canadense*), tick trefoil (*Desmodium canadense*), kuhnia (*Kuhnia eupatorioides*), boneset (*Empatorium altissimum*), were also present. I noted the following trees: White oak (*Quercus alba*), red oak (*Q. rubra*), quercitron oak (*Q. velutina*), bur oak (*Q. macrocarpa*), chestnut oak (*Q. acuminata*), dwarf chestnut oak (*Q. prinoides*), white ash (*Fraxinus americana*); in the lowlands (*F. lanceolata*). Of the elms, the slippery elm (*Ulmus fulva*), American elm (*U. americana*); the cork or rock elm (*U. racemosa*) on the rocky ridges a small tree wholly unlike in form from the rock elm as one sees it further north on the sandy bottom lands; red cedar (*Juniperus virginiana*), on limestone out crops; basswood (*Tilia americana*), sycamore (*Platanus occidentalis*) on the bottoms; black walnut (*Juglans nigra*) on bottoms and slopes, hickory (*Carya ovata* and *C. cordiformis*), soft maple (*Acer saccharinum*), black maple (*A. nigrum*), box elder (*A. negundo*), black cherry (*Prunus serotina*), choke cherry (*P. virginiana*), wild plum (*P. americana*), wild crab (*Pyrus lowensis*), hack berry (*Celtis occidentalis*), almond leaved willow (*Salix amygdaloides*), black willow (*A. nigra*), and sand bar willow (*S. fluviatilis*).

The more interesting shrubs observed were nine bark (*Physocarpus opulifolius*), a typical northern plant, buck thorn (*Rhamnus lanceolata*), black cap raspberry (*Rubus occidentalis*), sumach (*Rhus glabra*), poison ivy (*R. toxicodendron*), New Jersey tea (*Ceanothus americana*), dogwood (*Cornus asperifolia*), prickly ash (*Xanthoxylum americanum*), wild grape (*Vitus vulpina*), Virginia creeper (*Psedera quinquefolia*), bitter sweet (*Celastrus scandens*), wahoo (*Evonymus atropurpureus*), hazel nut (*Corylus americana*), moonseed (*Menispermum canadense*), buck bush (*Symphoricarpos orbiculatus*).

Of the herbaceous plants I noted the following: Golden rod (*Solidago serotina*, *S. ulmifolia*, *S. latifolia*), sunflowers (*Helianthus strumosus*), in woods; (*H. grosserratus*), along roadsides; artichoke (*Helianthus tuberosus*), bell flower (*Campanula americana*), white snakeroot (*Eupatorium urticaefolium*), iron weed (*Vernonia Baldwinii*), aster (*Aster novae angliae*, *A. sagittifolius*), everlasting (*Antennaria plantaginifolia*), cone flowers (*Rudbeckia laciniata*, *R. triloba*, *R. hirta* *Lepachys pinnata*), tall coreopsis (*Coreopsis tripteris*), Iowa thistle (*Cirsium Iowense*), wood thistle (*Cirsium discolor*), cup plant (*Silphium perfoliatum*), in prairie openings, greater lobelia (*Lobelia syphilitica*), bell flower (*Campanula americana*), Spanish needle (*Bidens aristosa*); on low ground, jewel weed (*Impatiens pallida*), sweet william (*Phlox divaricata*), prairie openings, sweet william (*Phlox pilosa*). In deep shaded woods, Indian turnip (*Arisaema triphyllum*), in woods, tick trefoil (*Desmodium nudiflorum*). Many other plants occur, but the writer has only noted those he has observed in a single day.

The region has a typical prairie and woodland flora. It may be of interest to note that Judge Williams, once a member of the probate courts, actively engaged in the nursery business planted a lot of trees over the Devil's Backbone area. One not knowing the circumstances might regard the white pine and paper birch as native. A considerable number of white pine were planted promiscuously in the area. Some of these trees are now 8 to 10 inches in diameter. He also planted some red cedar, paper birch, Douglas fir and white spruce. These latter trees, at once, give a clue to their having been planted. The white pine were planted in places where one not knowing the circumstances might regard the trees as native, as some people have supposed. The soil here is limy with a little mixture of sand on the surface. The nearest native white pine is in Hardin county on the Carboniferous sandstone.

CERRO GORDO, WINNEBAGO AND HANCOCK COUNTIES.

By L. H. Pammel, Botanist.

These regions can be discussed together since most of the drainage system is towards the Cedar river and Lime creek, which heads in north Minnesota flows through Winnebago county and northeast Hancock county, then into Worth county and Cerro Gordo county. This region has not only a number of most unique lakes, but a number of extinct lakes within the memory of man which now have become peat bogs. Through these peat bogs we now find wooded areas which formerly were islands and this reminds one of the lake region of north Minnesota with its numerous lakes and islands. The bogs contain an interesting lot of plants. Rice lake is the most important one of these which should become a state park.

DRAINAGE OF CERRO GORDO COUNTY.

By Samuel Calvin.

With respect to drainage, as in the case of topography, Cerro Gordo county is divisible into two areas. The portion of the county occupied by Iowan drift has relatively perfect drainage, and the stream channels are fairly well defined. With the exception of that part of the channel of Lime creek which passes through the northwest corner of Grant township, it can scarcely be said that there is a well defined water course in the area of the Altamont moraine.

Lime Creek. Lime creek drains the larger part of Cerro Gordo county. It enters the county from the southwest, and in the first part of its course it traverses the morainic belt already described. Entering Grant township in section 19, the stream flows northeast and passes into Worth county. Soon after entering Worth its direction is changed toward the east, and after flowing eastward for a few miles it escapes from the moraine and enters upon the area of Iowan drift. Here its course becomes normal for streams in this part of Iowa. It flows southeast, and soon re-enters Cerro Gordo county, crossing the north line of section 5 of Lincoln township. From this point its course is in the main southeast until it leaves the county at the east line of section 36 of Portland township.

Within the morainic belt, in Grant township, the course of Lime creek is very tortuous, since of necessity it winds back and forth to avoid the lawlessly disposed knobs and hills of drift. In this region the channel is new, dating only from the retreat of the Wisconsin ice. It is now a mere shallow trough in loose glacial detritus, showing only an inconsiderable amount of erosion since the stream began work upon it. There is here properly no river valley, nor are there any tributary streams with definitely marked channels. The drainage waters from adjacent lands find their way into Lime creek, sometimes by very roundabout courses, along broad, flat-bottomed swales, or through reedy, ill-drained marshes. In the Iowan drift area, however, Lime creek follows a preglacial valley that was originally in places two or three miles in width. In depth the valley varies from twenty to seventy feet. Its history is well recorded in the western part of Lime Creek township. Here the present stream flows in a small, shallow and narrow channel near the southern margin of the valley. The south bank of the stream rises abruptly to a height of thirty or forty feet. On the north side a plain with gentle slope begins near the level of the water and extends back to a terrace that is eight or ten feet in height. At the summit of the terrace there begins another plain that may be two miles or more in width, and is terminated on the north by an irregular line of low hills. The history seems to have been as follows: The preglacial valley had a width reaching from the south bank of the present stream to the line of hills which form the northern border of the second plain noted above. The sub-Aftonian drift, if it was ever deposited in this region, cannot be differentiated from the Kansan, but it is certain that at the close of the Kansan stage the old valley was only partially filled with detritus, and an important

drainage stream of the subsequent interglacial stage followed the old depression and in part re-excavated the valley. At the beginning of the Iowan stage the re-excavation was far from complete, its amount being represented by the space between the south wall of the valley and the first terrace north of the present stream. The Iowan glaciers deposited only a very thin sheet of drift over this region, but they carried numerous boulders that are scattered over the whole surface of highlands and lower plains. The plain between the terrace and the channel, and rising only a few feet above the level of the water, is thickly strewn with large Iowan boulders that have not been disturbed since they were deposited at the level on which they now lie. The present channel is a shallow trough cut in the Iowan drift of this lower plain, and represents the inconsiderable amount of erosion since the withdrawal of the Iowan ice.

The same history is recorded throughout the whole course of the stream in the Iowan drift area, except that during the interglacial stage, between the Kansan and Iowan glacial periods, the stream, for a few miles, was turned aside from the ancient valley and expended its energies in cutting the abandoned, rock-walled channel, already noted, that traverses sections 34 and 35 Lime Creek township, and a part of section 2 of Mason City. The evidence of the interglacial age of this abandoned channel has been given in connection with the discussion of the topography of the region.

It seems probable that during the preglacial and interglacial times the valley of Lime creek accommodated one of the most important streams of northeastern Iowa. After the close of the Iowan stage the Shell Rock river probably took part of the drainage waters that had previously found their way through various tributaries into the predecessor of Lime creek. At all events there was no pre-Iowan Shell Rock, for this stream follows no valley, and has cut only a shallow trough in the surface of the Iowan drift. Furthermore, the Wisconsin drift, particularly the Altamont moraine, choked up that portion of Lime creek valley which doubtless was produced northwestward from the point at which it crosses the northern boundary of Cerro Gordo county. As a consequence, the surface waters have been partly turned into new courses, while those that still find their way from the Wisconsin drift area into the old valley are obliged to wander tortuously among morainic knobs, and over areas in which drainage channels are altogether undeveloped. As a result of these changes the relative importance of the stream following this old valley has been greatly diminished.

The Altamont moraine, occupying the western townships of Cerro Gordo county, is an area that is practically undrained. Lime creek, as already stated, flows throughout the northwest corner of Grant township, but it occupies the only definitely marked stream channel in the morainic belt north of Clear Lake. In this region Lime creek has no tributaries except so far as the debouching sloughs and marshes afford opportunity for drainage of the adjacent areas. For many miles south of Clear lake there are no drainage channels, except broad swales that

wind in and out among the hills of drift. Indeed, the first definitely marked water course in this direction is found near Thornton in the eastern part of Grimes township.

The area of the Altamont moraine is one of unique topography. Geographically it corresponds very nearly with the western tier of townships so far as it is included in Cerro Gordo county. In the southwest it extends a short distance east of the limit of these, and occupies a few square miles in the western edge of Mount Vernon and Pleasant Valley townships. The surface of the area is quite irregular and presents a series of knob-like hills and undrained marshes arranged in the most lawless manner. Erosion has played a very unimportant part in producing the present surface configuration of this morainic belt.

One of the most broken and hilly portions of the moraine in Cerro Gordo county occurs in the northwest corner of Grant township. The hills are simply knobs of drift that were irregularly heaped up along the margin of the Wisconsin ice. Their height above the tortuous, marshy valleys that wind in and out and branch and rebranch without definable system, so as practically to surround each individual knob, varies from forty to seventy or eighty feet. The slopes are often steep. The traveler following the wagon roads must be content to make slow progress and must often make long detours to avoid impassable marshes or impracticable hills.

The topography of the greater part of Cerro Gordo county might be regarded by some observers as somewhat characterless and monotonous. Leaving out the western tier of townships the remaining portion of the county is a gently undulating drift plain, almost level over large areas. Stream valleys that have cut to but a very limited extent below the general level, and a few knobs or ridges that rise to a height of twenty to thirty feet above the otherwise unbroken plain, give some diversity to a landscape in general devoid of salient topographical features. The drift covering the county is in some places very thin; erosion since the deposition of the drift has been insignificant in amount, and hence the most conspicuous hills and valleys of eastern Cerro Gordo are in reality remnants of preglacial topography.

All the eastern part of the county is occupied by Iowan drift; the western tier of townships is almost wholly occupied by the knobs, ridges and kettle holes that characterize the marginal moraine of the Wisconsin drift, the Altamont moraine of Chamberlin. A small area in the southwest corner of Grimes township presents some of the characteristics of plains of Wisconsin drift, but this last area is so small as to make it comparatively unimportant. The county is, therefore, topographically divisible into two principal areas, the area of the Iowan drift and the area of the Altamont moraine.—Iowa Geological Survey, Vol. VII, pp 136-9, 142 and 132-3.

FLORA OF THE BOGS OF CERRO GORDO AND WORTH COUNTIES.

By L. H. Pammel.

These bogs are interesting from a phytogeographical standpoint. We have here representatives of a flora common in Minnesota to the north and the bogs of western Wisconsin. Many species have, however, disappeared in their immigration southward and northward. The conditions favorable for the development of these glacial plants have gradually disappeared, owing to the absence of proper soil and temperature conditions. The long and hot summers greatly increased the heat of the soil and water in which these plants thrive, hence their extermination. A few illustrations will suffice. The *Cirsium muticum*, though common in these bogs, occurs more commonly in Wisconsin marshes that are fairly dry during the latter part of the season. The same may be said of *parnassus*, (*Parnassia caroliniana*), dragon's head (*Chelone glabra*), meadow rue (*Thalictrum purpurascens*) and Lousewort (*Pedicularis lanceolata*). The Bog willow (*Salix candida*), kalm's lobelia (*Lobelia kalmii*) and cowbane (*Cicuta bulbifera*) are equally common in the bogs of western Wisconsin and Worth county. The beaked willow (*Salix richardsonii*) and pussy willow (*S. discolor*) are found throughout the Wisconsin drift area. The holy grass (*Hierochloa borealis*) hardly reaches the southern end of the Wisconsin drift as it only reaches as far south as Marshall and Hamilton counties. This grass, however, can hardly be classed as a real bog species as it is usually found on moist drift soils further northward. A hasty survey certainly shows that the Wisconsin drift has influenced in a marked manner the flora of northern central Iowa.

A brief list of the plants shows that the sphagnum which constitutes the bulk of the vegetation in the bogs of Wisconsin is entirely lacking in Worth and Cerro Gordo counties, and in place we find Hypnum. The bogs, however, contain a number of most interesting northern plants, among them Spanish needle (*Bidens beckii*), marsh thistle (*Cirsium muticum*), fringed gentian (*Gentiana crinita*), gentian (*G. quinqueflora*, *G. andrewsii*), parnassas (*Parnassia caroliniana*), cowbane (*Cicuta bulbifera*), brome grass (*Bromus kalmii*), meadow rue (*Thalictrum purpurascens*), pussy willow (*Salix discolor*, *S. richardsonii*), bog willow (*S. candida*). The *Salix richardsonii* and quaking aspen (*Populus tremuloides*), are quite conspicuous shrubs. Owing to the deposit of soil through cultivation these bogs are beginning to "dry up," as the common expression is. Scattered throughout the bogs are small groups of *Populus tremuloides* which in course of time will give rise to a mesophytic forest. In fact, the course of the formation of the forest here is very different than in northern Minnesota. The reason for this is no doubt the lack of forest-forming species in the immediate vicinity, the tamarack and spruce both being absent and no seed anywhere in the vicinity.

IOWA LAKES AND LAKE
AREAS

Iowa Lakes—

ASHBAUGH, LEWIS E.

FRANCIS, LESLIE E.

HINSHAW, E. C.

MACBRIDE, THOMAS F

PAMMEL, L. H.

IOWA LAKES AND LAKE AREAS.

SPIRIT LAKE AND THE OKOBOJIS.

By Leslie E. Francis, State Senator.

No person can appreciate the beauty of Spirit lake and the Okoboji lakes who has not seen them in summer; who has not stood upon their banks and watched the endless and never-ceasing movement of the launches, steamers and sailboats; who has not "picnicked" upon their banks or bathed in their waters.

No person, even though he has seen these Iowa lakes in the golden summertime, can appreciate their beauty unless he has also gazed upon them in the fall; has seen the golden hues of the leaves as autumn has brought its changing and varied colors, and who has not in the early morning seen the mist arising from the lakes and has watched it change into its many varied and fantastic forms; who has not watched the waves in the colder days of approaching winter, as they dash upon the shore, coating stone and stump and projecting limb and dock with ice, freezing in strange and grotesque shapes; who has not seen the trees along the lakes white and glistening in the frost of approaching winter.

No person, even though he has witnessed the lakes in summer and in the fall, knows the real beauty of the lakes until he has seen them in the wintertime and has watched the ice form as the cold November days seize the waters of the lake in their icy grip; has watched the skaters as they glide to and fro over the glistening ice; or the iceboats as they move with a speed equal to the fastest automobile; or the snow as it falls in the stillness of a quiet night upon every tree and shrub growing upon the banks of stream and lake, to greet the visitor's gaze in the dazzling sunlight of a bright and beautiful winter's morning.

No one can thoroughly appreciate the beauty of the lakes until he has witnessed the change wrought in the days of fall and by the icy hand of winter.

No person, even though he has seen the lakes in all their summer glory, in the grandeur of fall and in the magnificence of winter, can fully know them until he has seen them in the days of spring, has watched the small but innumerable streams carry their burden of water gurgling and splashing between banks of green, among stones and along the roots of beautiful trees to replenish the waters of the lake; who has not seen the ice as the returning warmth of spring has robbed it of its sternness, one day glistening in pure whiteness and the next, without apparent reason, as blue as the waters of the ocean; and then has watched the ice go out and seen it by some strong wind crushed upon the lake shore, pushing sand and rocks and even trees before its irresistible movement. Then, in the springtime, comes the return of wild fowl, of ducks and geese with their calls; birds in the trees seeking their mates and a suit-

able nesting place. Then the buds break out upon the trees and the leaves come and the beauty of spring is here.

Even though the traveler has viewed the lake region in all the four seasons, he has yet missed its greatest beauty if he has not stood some day upon the banks of one of these lakes and witnessed the gathering of a storm; has seen the clouds gather and roll in forbidding streams down upon the waters of the lake; has seen a gust of wind seize the still waters and dash them into waves of fury; has watched the boatman seek protection behind some projecting point; has witnessed the coloring of sky and water as the storm approached; has stood in the windows of his cottage and watched the storm break in its fury upon the lake, and then a little later, from his porch has watched the storm pass on and the quiet and calm of evening come over the lake that follows such an outbreak of nature; has witnessed the sun come from behind the clouds, causing every raindrop still clinging to leaf and branch and every wave still dashing upon the shore, to glisten and shine back the beauty of the western sunlight.

Until the visitor has seen the lake region in all of the different seasons of the year and in all its varying moods, he cannot know of its beauty; but here in Iowa within reach of its every citizen, here at home, we have the most beautiful lakes to be found in all America, the most splendid scenery within a thousand miles, a playground, if you please, for all Iowa, for the men and women and the children who will be made better citizens and have greater pleasure in life if they may be permitted to enjoy these manifestations of God's bounteous gifts to us, His children.

The first white man to set foot in the lake region of northwestern Iowa was doubtless Father Hennepin, who, with his two companions, was brought to Spirit Lake and there held as a prisoner of the Indians, almost two and a half centuries ago.

At the time of the Lewis and Clark expedition in 1803, it is known that a white man visited the lake region, as reference is made to the greater Iowa lakes in the report of that expedition.

The third white man to stand upon the shores of these lakes was John C. Fremont, who in 1838 camped on the northern shores of Spirit lake where Crandall's Lodge is now located.

The first actual settlers came in 1856, consisting of forty or more men, women and children, among them Abbie Gardner Sharp, survivor of the massacre of 1857 and historian of those terrible events.

The Spirit lake massacre occurred in the early days of March, 1857, resulting in the death of about forty men, women and children and the complete destruction of the settlement around the lakes. Four women were made captives, two of them being killed in captivity and the other two, after months of privation, being ransomed and restored to civilization. The only monument of this earliest settlement remaining undestroyed is the Gardner cabin at Pillsbury Point on West Okoboji lake immediately adjacent to the beautiful monument erected by the state in 1894 in commemoration of the massacre of 1857.

Dickinson county is the smallest county in the state of Iowa, yet it has within its limits the most magnificent system of lakes between the Allegheny and the Rocky mountains, and also has the distinction of hav-

ing upon the banks of West Okoboji lake the highest point between those two mountain systems.

Spirit lake begins on the Minnesota line, and north of it and in the state of Minnesota, are six or eight small lakes, all tributary to Spirit lake and connected therewith, many of them very beautiful. Spirit lake itself is a body of water four miles in length north and south and approximately four miles in width east and west at the widest point. Gazing upon the lake from the banks, it appears to be nearly circular. On the west there are six or eight small lakes, all having their outlets into Spirit lake. The town of Spirit Lake is located on the west bank of East Okoboji lake, which lake begins at a point forty rods south of the south shore of Spirit lake and extends in a southerly direction to a point where the public highway from the south crosses the lake at Okoboji, a distance of about eight miles. East Okoboji lake varies in width from ten rods at a place called the Narrows, to two miles. It connects with West Okoboji lake at Okoboji where the public highway above referred to crosses, so that the two lakes are in fact one body of water, steamers and all lake craft having access to both lakes. West Okoboji lake is six miles in length and varies in width from one to three miles, with high banks and very deep blue water. Southeast of these lakes and immediately east of the town of Arnold's Park, which is situated upon the east bank of West Okoboji lake, is a series of lakes formerly known as Gar lakes. Some years since, the state constructed a canal from East Okoboji lake into and through a part of this lake system, thus making these beautiful lakes accessible to small craft from the larger lakes. The outlet from the entire lake system extends through these lakes, Spirit lake draining into East Okoboji lake, West Okoboji lake also draining into East Okoboji lake, and thence on through the Gar lakes into the Little Sioux river, and ultimately into the Missouri river.

In various places in Dickinson county there are other lakes—Center lake between East and West Okoboji lakes, Swan lake in the eastern part of the county, Diamond lake just west of Spirit lake, and Silver lake, a considerable body of water near Lake Park in the western part of the county.

The lake system of Dickinson county has at least one hundred miles of lake shore, a large amount of which has shelving sandy beaches, affording splendid bathing privileges. The banks of nearly the entire lake system are fringed with timber, consisting of oak, ash, hickory and various other trees indigenous to the region. When the early settlers came into this territory, the groves around the lakes consisted of very large trees, mostly white oak, often three feet in diameter. As is often the case, however, in a new country, little attention was given to the preservation of these magnificent trees, and, except as they were here and there preservd around farm buildings, they are cut down and sawed up for lumber, used in building the early homes in the county. The beautiful forests now fringing the lakes, therefore, are a second growth, consisting of the smaller tree here at the arrival of the first settler now developed into substantial trees, but in no manner comparing with the grand old oaks of the original forest.

The first railroad of the lake region was in operation in 1881, being followed a little later by a second railroad, so that the lake region now has two lines of railroad, the Rock Island from Chicago, Cedar Rapids, Minneapolis, Sioux Falls and Watertown, and the Milwaukee from Des Moines direct, with various connections east and west.

The first steamer, the Favorite, was a boat about twenty-two feet long and ten feet wide, occupied mostly by its engine and capable of a speed enabling it to keep out of the way of a rowboat if its engine was working well. The lakes now have at least a dozen large passenger boats, the largest carrying not less than six hundred passengers; also innumerable launches, public and private.

Hotels have been constructed at various points around the lakes so that there are abundant facilities for the care of tourists. At Arnold's Park has been installed during the past few years all of the modern attractions found at Coney Island and places of that character.

Nearly the entire shore of West Okoboji has been platted with lake-shore lots; back of these a street and another tier of lots facing upon this street. Hundreds of cottages have been constructed along the lake shore so that in passing along one of these lake-shore roads, it presents the appearance of the residence portion of a city. Many cottages have been constructed upon the banks of the other lakes, and at this time a plat is being made extending from the south limits of the town of Spirit Lake along the west bank of East Okoboji nearly to the south end of the lake, laying out lots two tiers deep along the lake shore, with a graveled driveway between, making one of the most beautiful drives to be found anywhere.

There are good roads extending around Spirit Lake, a considerable part of the distance being a few rods only from the bank of the lake and always within a short distance of the lake shore. Similar drives extend around West Okoboji lake, and upon completion of the plat immediately south of the town of Spirit Lake above mentioned, there will be a similar drive around East Okoboji lake.—Iowa Magazine, No. 6, 1917, pp 3-6.

OUR LAKES NEED PROTECTION.

By L. H. Pammel, Botanist.

At the present time the state does not own, or at least owns very little of shore lines of lakes in the state. Rapidly as possible the state should acquire certain areas along the lake for the purpose of permitting every citizen of Iowa access of the same. Complaint has been made to the Conservation Board that in a number of places, at Storm Lake, Lake View and Clear lake, also other places, people do not have access to the lakes. This should not be the case in a great commonwealth like Iowa. Certain definite areas should be purchased for park sites and these should be dedicated to the people. There is a constant clamor to drain the lakes and lower the water level. Mr. Hinshaw, the Fish and Game warden, during the last few years, made every effort to increase the depth of water.

Dr. T. H. Macbride in a letter to the Board, makes the following complaint and urges that this be not done:

"I learn from reliable sources that the retaining dam across the outlet of the system of lakes involving Spirit lake and the Okoboji's is objectionable to some people and that these are attempting to have it removed.

"As I understand it, the dam has been built at the expense of the state and is practically under state control. I sincerely hope that the efforts of those making the attempt to break it up may not succeed. It would change the level of the water in the Okoboji system five or six feet and would be disastrous to the shores of the lake in a great many places. It would make weed patches of the so-called Gar lakes.

"I beg to call your attention to the situation, confident of your interest and readiness to serve the large number of property owners along the shores of Okoboji lake, as well as the people of the commonwealth in general. I am writing you as a member of the Iowa Conservative Commission."

Dr. Pammel wrote this in reply: "I am in receipt of your letter of January fourth and I am surprised to learn that an effort is being made to remove the dam across the outlet of the system of lakes. I certainly think this is the property of the state and should be retained. I certainly hope it will not be pulled up. It would seem to me to be a short-sight policy."

THE LAKES OF IOWA.

By Thomas H. Macbride, President State University.

It is a rule with landscape artists that a glimpse of water is essential to a perfect vista. Doubtless the meaning of the rule lies deep. All sorts of men enter into the enthusiasm of that famous body of soldiers who on occasion, in school-boy memory shouted "the sea! the sea!" Perhaps rivers and lakes and seas were the natural guides of men in their earliest wanderings and migrations so that they learned to look with comfort upon some peaceful expanse as of lake or river.

Be this as it may, men of refinement, at least, the world over, have delighted always in the changing beauty and restfulness of inland waters. From Switzerland to Scotland the lakes year by year, summon expectant hosts of happy travelers. In our own country, lakes quite as attractive are not so common; those of New York and Wisconsin, however, are already famous, and those of Iowa are just entering upon renown.

The prairie lakes are all too few, in the great state of Iowa scarcely a dozen, but some of these are very beautiful and will all one day be prized. The finest are as fine as any. Indeed, men who have seen the landscape of England's lake district aver constantly that our Spirit lake-Okoboji group rivals the best in either England or Scotland and except for attendant mountain scenery is as beautiful as any inland water in the world.

The lakes of Iowa have been neglected. They are the property of the state and like any piece of public property left untended, our lakes have been abused. Only recently has it been thought worth while to care for native groves to protect the shores from defilement, and clear the waters of obstructions and erosion.

But today the case is different. The lakes are coming into their own. Cottages that cost thousands rise on wooded points, commodious steam-boats pass from pier to pier, while sailboats and launches by the hundred enliven the landscape at close of every summer day.

Our lakes lack the background of snow-capped mountains, else we had Switzerland or Alberta; but we do have winding shore lines and great variety of hill and valley. "High points" rise on every side, conspicuous landmarks to the traveler. From any one of these the prairie landscape is beautiful in the extreme. The "highest point in Iowa," for instance, affords a view of the whole lake system, and prairie villages dot the plain over a circle whose radius is fifteen or twenty miles. On these high points and shore lands even in mid-summer cool airs are stirring all day long; there are not more delightful places the country over.

Nor are these Iowa lakes without wonderful scientific interest. How came they where they are? What agency tossed the prairie into a landscape of tumultuous hills on every side? What erosion deepened Okoboji so that great pike and bass hide in the cool recesses of the rocks a hundred feet below the shining surface of the crystal water—water green as Lake Michigan? What energy rip-rapped these shores for rods together with granite walls of stone brought from all the natural northern quarries of the world?

So attractive are these lakes to men of science that the university alumni have established a research station on the western shore-line near the "highest point"—and here university professors offer lecture courses year by year to tell the natural history of the region. These courses are open to students in limited number, who camp on the hillsides above the lake and spend some weeks investigating physical geography, botany, geology, zoology—and competent judges say there is no opportunity so fine for such research in all the continent. Here is the noblest illustration of the dynamics of the glacier, of pure glacial geology to be found in all the United States. Indeed, northern Iowa is classic ground for the geologists of the world. Hereafter the surface geology of our planet may not be intelligently discussed anywhere without reference to Iowa and the facts for which our group of lakes makes statement to all whose choose to read.

The botanist finds about the lakes, such is the strange topography here, the most varied vegetation; aquatic plants bloom in scores of species everywhere—in lake, in pool, in marsh and shallow; plants that represent the dry western plains occur upon the wind-swept hilltops and the flora of all the northern prairie occupies the successive levels between lake and mesa.

As the flora varies, so changes the fauna, so that we have animal life of every sort; life adapted to deep fresh water, and life where water there is none, save as it falls in rain but abides not.

On East and West Okoboji one may sail today in a single course a distance of twelve miles; presently a deepened channel will connect Minnewashta, then locks will open the way to great Spirit lake and the length of the course will be almost doubled. Fine highways already bring the various points along the miles of shore line almost everywhere in easy access, and the time is not far when the Iowa northern lakes will be not only the summer home of hundreds of families, even as now, but the delight of thousands who love natural beauty and find solace in the gentle ministrations of the natural world where sky and meadow, woodland and placid waters meet.

Nor less will science here have place. The Lakeside Laboratory is a beginning only. The movement is even now in progress which shall make "the highest point" the pedestal for a telescope; shall build a meteorological station for the United States, that from such point of survey the climatic conditions of the vast northwestern prairie may be studied and all our human procedure be more securely guided, if not by the influence of the stars, at least by certain knowledge of those aerial tides which bring the early and latter rain.

The northern lakes are the property of the state; they constitute an inviolate natural park and are destined to become the most beautiful playground for all the people of the whole northwest; shall not Iowa conserve its own?

PRESERVATION OF IOWA LAKES.

By Lewis E. Ashbaugh.

The question of lake preservation may be justly considered an important topic for the people of Iowa, and it is especially appropriate that the Iowa Park and Forestry Association take interest therein at the present time. Nature has given to this great state rich and abundant blessings in many ways, but in the matter of beautiful lakes of clear, blue water, with sandy shores, and with high banks covered with native forests, we realize and admit that we are not well favored.

Some of us have grown up in other states, or in certain parts of this state, where lakes are frequent, and well do we remember the Saturday excursions of our childhood days when we trudged off in the early morning with our lunch basket, fish-pole, and tomato-can of worms, to spend the day on one of the nearby lakes. Perhaps we got only a few small perch or sunfish, but there was great pleasure in rowing the big flat-bottomed boat around the shores and across the deep, blue waters. And who has enjoyed more pleasure than pushing a boat among the lilies in search of the beautiful white flowers? And what is more exhilarating than the swim in the clear water, along easy sloping, sandy shores, or in the winter season, the lively skating with its games of tag and shinny? The bath houses and skating rinks of our cities are poor substitutes to one accustomed to nature's provisions.

The condition of this state as regards its lake resorts and pleasures was noted very emphatically when a party of forty students went to the

Des Moines river on survey work, and of this number only two or three were found who had ever rowed a boat. Such a condition presents this problem in simple arithmetic: Subtract from the daily work and play of the average youth, and of the adult as well, the clean and healthful pleasures of boating, swimming, fishing, picnicking and camping, with a good part of hunting and the result will be what?—little else than work, with perhaps some athletics to take the place of those other pleasures, or more likely only society gaieties.

The immediate cause for need of activity on part of the people of Iowa in regard to lake preservation is the fact that a legal method of procedure has been authorized by which meandered lakes of certain character may be drained and improved for agricultural purposes. The advisability for maintaining and preserving certain lakes for pleasure purposes will never be questioned. Similarly there are certain lakes, so-called, of which no one will question the advisability of drainage.

The United States government surveys of fifty years ago regarded as lakes many bodies of water which are merely ponds or sloughs at the present time, and this association which seeks to preserve the natural beauty of, and usefulness of, forests and stream, hill and dale, will sanction the idea of draining and improving these sloughs which are no value, but are a menace to the health, the agricultural interests, and the general welfare of the community. But there is a middle ground which is here not the usual safe middle ground, but the doubtful one. Many of these lakes are part lake or clear open water, with perhaps the larger part slough or marsh. The adjacent property owner will usually desire that the lake be drained while others may desire its preservation.

The portions of the act of the last legislature, which are of most interest to our association, read as follows:

"Sec. 1. The executive council of the state is hereby authorized and empowered to survey the meandered lakes and lake beds within the state, and sell the same as hereinafter provided, and determine what lakes shall be maintained as the property of the state and what meandered lake beds belonging to the state may be drained, improved, demised or sold.

"Sec. 2. Upon the presentation to the executive council of a statement signed by not less than fifty (50) freeholders, twenty of whom shall be actual residents of the township or townships in which said lake or lake beds are situated, of any county that any meandered lake or lake bed in such county is detrimental to the public health of the general welfare of the citizens of the county, and that it is unwise to maintain such meandered lake or lake bed as a permanent body of water, and that interest of the state will be subserved by draining and improving such lake bed, the governor shall within thirty (30) days after the receipt of such statement, appoint a competent engineer who shall at once examine the situation and condition of such lake or lake bed, make a survey and plat thereof, and ascertain whether its location is such that it can be drained and improved, and make a full report to the executive council of the area and depth of water in the lake and its

general physical condition, which report shall be accompanied by his plat, field notes and profile of his survey.

"Sec. 3. Upon receipt of the report of the engineer, the executive council shall determine whether such lake or lake bed shall be maintained and preserved as the property of the state, or whether the same shall be drained, improved and the land included within the meander lines thereof sold in the manner hereinafter specified.

"Sec. 4. If the council shall determine that such lake or lake bed ought not to be drained, demised or sold, the same shall be kept and maintained as the property of the state for the benefit of the general public. If the executive council shall determine that it is to the interest of the state and the general public that the lake or lake bed, as to which the statement is presented, be drained, improved, demised or sold, it may permit the same to be drained under the drainage law of the state."

There are in this state about one hundred meandered lakes, exclusive of a few former river channels along the Missouri and Mississippi rivers, which are lakes on government records. Some of these abandoned channels are very nice lakes, such as Horseshoe or Brown's lake, south of Sioux City. It may be said that nearly all our lakes are in the north-west quarter of the state.

The United States government surveys recognize as a lake any body of water which has an area of 25 acres or more. It was required that all such waters should be meandered, i. e. survey lines should be run around the lake, near the boundary, yet on the high ground or banks if there are such, for the purpose of defining the position of the lake, and for ascertaining the acreage to be deducted from each forty acre tract of adjacent farm lands. The description in the deeds for surrounding property calls for lands extending to the meander line; the property owner usually has the right to use all the land extending to the water's edge. A meandered lake is state property and can be drained or sold only under an act of the legislature.

There are many lakes or area less than twenty-five acres which are really private property, the land owner holding deed thereto, paying taxes thereon.

There may also be found lakes of twenty-five acres or more lying entirely within a section, hence not cut by section lines, and passed over by the government survey without meandering.

Under this recent act of the legislature fourteen petitions have been filed and surveys made. At least nine of these fourteen lakes would be classed as sloughs or large marshes. One is a long, narrow, stagnant pond, an abandoned channel of the Missouri river. After recent wet years some of these lakes are now in good serviceable condition for pleasure purposes, but during the dry seasons of three or six years ago, the water was very low, and in some places the entire lake bed was dry, in many places permitting cultivation.

On these lakes only four reports have been considered and decisions given by the executive council. Several reports are now before that body. A detailed report of the investigations is not, therefore, advisable at this time. It may be stated, however, to the gratification of our association that it is the purpose of the executive council to maintain every

lake in the state that is of any reasonable service to the people. Sufficient time is being given for all interested parties to give their claims or desires. It is to be hoped that those who enjoy the lake pleasures will be as active in presenting their views to the council as are those seeking drainage or expansion to their farms.—Iowa Park and Forestry Association, 4th Report, pp 85-99.

OUR LAKES AND RIVERS.

By L. H. Pammel, Botanist.

I have called attention to the preservation of our lakes. Where possible these should be preserved. We have comparatively few, but they add to many of the attractive features of Iowa. In a measure these lakes are public property and should be so regarded. The pleasure resorts are for all the people, and not only for those who can afford to pay for the many pleasures connected with them. A recent decision in the New York Court of Appeals, Wm. Rockefeller, affirmed a judgment of eighteen cents damages and \$700 costs against a mountaineer who fished in the fish reserve of Mr. Rockefeller in the Adirondacks. These parks are for the people. The Rockefellers along with J. Pierpont Morgan and several other wealthy New Yorkers have purchased large tracts of land in the Adirondacks, conceded to be one of the finest of park regions in the East, for the middle classes to spend the summer. While I can see no objection to these wealthy people buying this land for their own pleasure, it does seem that a state having the wealth that New York has should be able to control these areas for timber and park purposes for the benefit of the people at large, those who have not the means, for there are thousands of people in New York who would like to enjoy the privilege of a short vacation in the mountains. It would seem to me that the state of Iowa should reserve for the use of its citizens parts surrounding the lakes for the people at large. I refer especially to shore lines. The shore lines of all these lakes should be provided with wide and ample drives giving the general public an opportunity to utilize the lakes in a legitimate manner. These shore lines should be the property of the state.

There are places in the state, not numerous to be sure, that should be guarded and protected. I refer to "the Ledges" in Boone county, a small area there should become the legitimate property of the county, the city of Boone, or the state, to be preserved forever for the uses of the people. Then there is a limited area in Muscatine county, "Wild Cat Den," with its unique trees of the north and its southern flora. A greater assemblage of southern plants is not to be found anywhere else in the state. We also have a limited area in Hardin county, on the Iowa river, near Steamboat Rock, especially well known to all lovers of plants. Here is a region where the white pine, and cherry birch are found. There is no such an assemblage of plants in any other region in the state, besides it is a beautiful spot. Then there is a little area in Allamakee county

where the balsam fir, white pine, and white birch grow in conjunction with a number of boreal plants.

None of this land is worth much for agricultural purposes but from a botanical standpoint and the standpoint of beauty, none are comparable to them. Should not the state or various counties where these places are located protect and preserve these from spoilation?

I am glad for the healthy sentiment in this country that is trying to preserve the scenic beauty of the Niagra gorge, and I wish that we could not only raise our voices in behalf of these great American wonders, but that we might add to them by clothing the surroundings with trees and forever dedicate them for the use of the American people.

I think few of the cities of Iowa realize the beauty of certain of our streams. There is scarcely a region in the west that can present so many beautiful views as the distance lying between Savannah on the Mississippi to New Albin in Allamakee county; it has truly been called the Switzerland of Iowa. Along this great stream the railroads skirt it upon each bank and beyond the railroad we have the timber with its precipitous bluffs, timbered mostly with the young growth of mostly deciduous trees of the oak, hard maple, the birch, the elm, hickory and butternut. Here and there efforts have been made, especially near the cities of Dubuque and Clinton, to utilize some of this for summer resorts. I wish that every foot of this rough ground between St. Paul and Clinton might not only be utilized for the growth of timber, as it is admirably suited to be, but also for park purposes.

The above subject naturally leads to a discussion of city forestry, a matter that I called your attention to last year. The subject of city forestry will become more and more important as the country becomes older. I have before me a circular in which the status of the case is pretty well stated. City forestry must eventually become equal in importance to city park making, as the people learn more of the economic value of inaugurating a system of practical management for the parkings, boulevards, vacant lands, etc. The advisability of any city adopting forestry would seem plain, when we consider, according to Mr. C. Jensen:

"I. That the parkings alone contain a greater combined area than the parks. (Some cities have parkings, but no parks proper.)

"II. That the parkings are seen by a greater number of people on a greater number of days in the year than the parks.

"III. That every taxpayer and resident would profit by it directly.

"IV. That from the economic as well as from the aesthetic standpoint, extensive and judicious tree planting should precede any other feature in beautifying grounds of any kind.

"The backwardness of our cities in introducing forestry may be ascribed to the fact that forestry is comparatively new in this country and as yet only a few men are properly trained to make working plans for the management of municipal forests, parks and ornamental grounds."

I want to urge also particularly in this connection the importance of establishing driveways along our streams. Many of our important cities in the state of Iowa are located on streams. Adjacent to these streams we should have public parks and where convenient a wide and ample driveway should be provided along the stream. How much more beautiful

the city of Des Moines would appear to a stranger if in place of the present conditions which exist, there were a driveway on the east and west sides of the river, from the city limits on the north to the city limits on the south. What infinite pleasure the toiler might receive by taking a stroll along this boulevard with its drives and walks and flower beds. There is nothing that would add so much to the beauty of Des Moines as a little bit of awakening in this direction. This good work might well be extended to other cities in the state.—Iowa Park and Forestry association, 6th Annual Report, pp 32-8.

PRESERVE AND IMPROVE OUR LAKES.

By E. C. Hinshaw.

I heartily recommend that the next legislature provide ways and means for the preservation and improvement of every lake in the state. No lake should be drained, at least until the proper experiments have been conducted for their improvement. If it is found that certain lakes cannot be improved and it should be the wish of the people in the locality where such lakes are located that they should be drained, the state will not have lost anything by delaying the drainage a few years. I am confident, however, that there is not a community where one of the lakes are located that will want their lake drained after they once see what can be done by way of improvement.

Let me repeat what I have said before, that more pounds of fish can be raised in an acre of proper water than it is possible to raise pounds of beef on the best lands that Iowa affords. These fish are worth more per pound than beef, and this does not take into consideration the recreation, which is much more valuable than either the fish or beef and cannot be figured in dollars and cents.

Let us not forget in our mad rush for land to raise corn, that there are other things that count besides the almighty dollar. Let us preserve our lakes; let us improve our lakes; let us provide parks around each lake, where the people can go for picnics without trespassing; let us provide such places in that part of the state where there are no natural lakes by building dams, etc., and creating small lakes. Why is it we have not had more support in our efforts along these lines? Maybe it is because the people haven't understood. Let us all get busy and then these things will come and come easy.

If some of the people who are so anxious to drain lakes will investigate some of the lake beds that have been drained for several years and find that they are nothing more than swamps and are absolutely worthless for agricultural purposes, and talk with the farmers who have been forced to pay large sums of money for imaginary benefits, they will not be so strong for lake drainage. Let the legislature make provision for the improvement of lakes and see how fast the sentiment grows in each community to have their lakes improved.

The greater lakes of the state, including the Okoboji, Spirit lake, Clear lake, Wall lake in Sac county, and others that have been used as resorts by thousands of people for years, have never received any state aid or assistance.

It is a disgrace to a state like Iowa to have such beautiful lakes within her borders and give them no attention, or make any provisions whereby the public can enjoy them without trespassing. The state should purchase now suitable parks around every lake in Iowa and provide highways to these lakes for the benefit of all the people. There are several places around the great lakes now where there is no opportunity for the people to get to the lake shores for the purpose of hunting, fishing, bathing or picnicking, without being ordered off by the land owners. Let us talk conservation, preservation and lake improvement.—Report of State Fish and Game Warden.

STATE PARKS AND
RESERVES

State Parks and Reserves—

CULLEY, FRANK H.

CURTISS, DR. C. F.

LAZELL, FRED J.

MACBRIDE, DR. T. H.

MCDONALD, G. B.

MORBECK, G. C.

PAMMEL, L. H.

SCHMIDT, G. PERLE WILSON

SCHERMERHORN, ZELLAH M.

STATE PARKS AND RESERVES.

FOREST PARKS AND THEIR RELATION TO THE RURAL COMMUNITY.

By Charles F. Curtis, B. Sc., D. S.

I am very greatly interested in the purpose and the work of this organization, the Iowa Park and Forestry Association.

Nature has done a great deal for Iowa in the way of most pleasing and attractive scenic beauty. The Indians seem to have recognized this in the name that they gave to Iowa, "Beautiful Land." I do not know that we, as a whole, have been altogether as appreciative as the Indians, in recognizing and making the most of these places of beauty. In fact, some of them have been ruthlessly destroyed. I think it is very important, indeed, that a sentiment be created, in making the most of our places of beauty and the attractive places for recreation. We are all greatly interested in the plans for establishing a national park in northeastern Iowa, and it is certainly to be hoped that plans for that work may be constructed in the near future and we may have a park which will be most pleasing, attractive and useful to the people of the state and the nation. The automobile has become a great factor in the welfare of the community. I think it is highly important that we consider the development of the park in connection with this, not only for the tourists who are going through the state, but for our own people. The people of the state can utilize these parks to a much larger degree as the highways are improved and the automobile comes into more general use.

We have a great many other places in the state that should be utilized as parks under state supervision or even under county or community supervision. I think we ought to begin to develop a state policy of utilizing and preserving and making the most of these places.

I suggested a year ago, when this association had a meeting here, the state has a large fund accumulated through the office of the State Game and Fish Commission, that comes from the contributions of the people of the state who take out licenses, and it seems entirely fitting and proper that this fund be utilized in a way to be of most service to the people of the state and of permanent value, and the proceeds from the fish and game licenses might be applied on parks for the conservation of fish and game to excellent advantage, I believe. I believe the Fish and Game Commission has recommended that tracts of land be purchased at certain places in the state along the streams where fish and game may be preserved. I believe that it would be an excellent idea to carry out some such plan. I think we might go farther. We have a good many lakes in the state and some of these afford ideal places for establishing game and fish preserves. In these sections the land is not very valuable

for farm purposes, fortunately. The highway commission has been making a survey of many of these lakes in the state during the past biennial period and has made a report to the legislature and before the people of the state.

I believe we ought to consider well the feasibility and practicability of utilizing all these places in the state, to the highest degree in the way of natural parks and recreation grounds. Nature has been rather liberal with the state in that way, yet we have not appreciated the value of the preservation of these places as we should

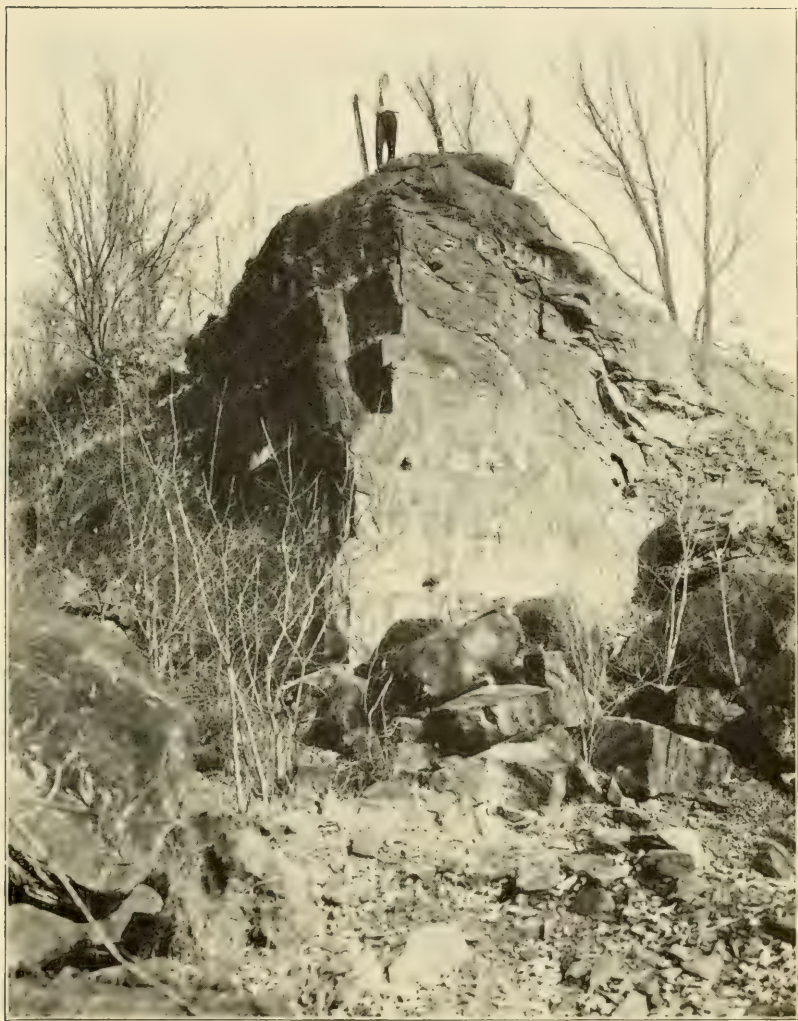
I am very much pleased, indeed, that this association is giving attention to this problem, issuing excellent reports—as they have been doing, putting these things before the people and the legislature in such a way that they may make the most of the opportunities that we have to preserve these beauty spots.—*Iowa Conservation*, Vol. 1, No. 1, p. 18.

FOREST PARKS IN IOWA.

By G. B. McDonald, Botanist.

Many of the early settlers in Iowa looked upon the forest as an undesirable encumbrance to the land and, as was their custom before coming to this section, they started a program of forest destruction. Even with a relatively small timber area in Iowa, the pioneer cut the forest trees not only on the level stretches which could be put under the plow, but also turned his attention to the hills where this process of deforestation was continued for the purpose of adding a few acres for crop production or grazing. Defensible as such a program is in general for the pioneer, the results of continuing this process of forest destruction beyond reasonable limits, are not difficult to picture. We need only to turn to sections in China or other countries to see the effect of total forest destruction on the surrounding country. Even though the topography of the state is not such as to cause the worst damage after the cutting of the forests, yet any fair minded citizen can see the many undesirable features of continuing such a policy.

We are told that some of the best developed commercial countries of Europe have reserved as timber lands from 20 to 29 per cent of their total land area. We are further told that countries depending to a large extent on their own timber production must have approximately this percentage of their land surfaces reserved for timber production. The fact that the state of Iowa is able to draw its principal lumber and timber supplies from adjoining states does not indicate that it is desirable to allow waste areas or rough lands to remain idle or only partially productive when such areas are particularly well adapted to the production of timber. From an economic standpoint, it is not desirable for the state to permit potential forest areas which cannot well be handled through individual means, to remain idle or only partially productive, just the same as we would consider it undesirable for the farmer to disregard the cultivation of a tract of agricultural land merely because it



Red Rock, Marion County.



Mississippi River Near Lansing.



Little Wall Lake, Hamilton County.



Mississippi River Near Lansing.



Little Sioux River at Peterson.



Ocheyedan Mound, Osceola County.



Boneyard Hollow, Webster County.



Crags in Devil's Backbone Park, Delaware County.



North Twin Lake, Calhoun County.



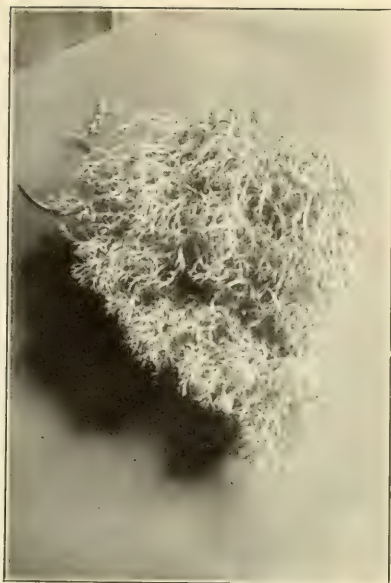
Waterville Park, Allamakee County.



Entrance to The Ledges, Boone.



Pasque Flower, or Crocus.



Reindeer Lichen, Ledges, Boone.



Purple Cone Flower.



Canadian Yew, Palisades, Linn Co.



Islands in Mississippi River Near Lansing.



Wooded Scene at Devil's Backbone, Madison County.

was weedy or less accessible than other portions of his farm. Naturally such hilly regions and waste lands which are suitable only for the production of trees and which cannot be planted and cared for by the individual, due to the long period required for the production of the crop of timber, should be taken over under state control and developed as state forests or state forest parks.

We need only to turn to European countries to see the extent to which the forest idea and park idea are worked together. In fact, practically all the forest areas in the thicker populated districts in Europe serve the people for parks as well. In this way the state is not only securing a regular revenue from the forest products produced, but each locality has splendid forested areas for recreational purposes.

It is interesting to note the changing ideas in relation to the development of our national forests. During the first years of national forest administration, the people felt that the principal idea in mind was merely the perpetuation of an adequate timber supply for this country. Important as this feature is, it is not by any means the sole purpose of our national forests. Soon after their establishment, it was found that many areas were well suited for the grazing of stock. Provision was made to utilize the forests in this way. Later, many of the forests situated in the higher mountainous regions were found to be capable of being developed for water power. This has been done and the electric power developed is now being utilized in many different ways. Within the past few years another means of usefulness for the national forests has come to the attention of the public. Although a few in the past years have made use of the national forests for recreational purposes, yet the great majority of the people owning the 165,000,000 acres of national forests did not realize the value of these extensive areas for camping, hunting and recreational purposes. It is only within the past year or two that those in charge have undertaken the systematic opening up of our national forest areas for the recreational use of the people. The possibilities of our national forests for use and as pleasure grounds are unlimited. Their boundaries embrace the finest scenic features of our country and among the finest of the world. We are well aware of the fact that the men who originated and developed the national forest idea had in mind the tremendous value of these areas for the use of the people. Ex-President Roosevelt in one of his messages to congress, said that these national areas "should afford perpetual protection to the native fauna and flora; safe haven of refuge to our rapidly diminishing wild animals of the larger kinds, and free camping ground for the ever increasing number of men and women who have learned to find rest, health and recreation in the splendid forests and flower-clad meadows of our mountains. The forest reserves should be set apart forever for the use and benefit of our people as a whole and not sacrificed to the short-sighted greed of a few."

Although the splendid national parks and national forests are found largely throughout the western country and serve a limited number of our people, yet it is hardly necessary to mention the fact that the great majority of the people are unable, for business or other reasons, to

travel great distances annually, in order to secure recreation and rest which is essential to good health. For this reason the states, especially those of the prairie region, would pursue a wise policy in the establishment of state forest parks which would be within easy reach of every man, woman and child in the state. The value of a program of this kind toward the welfare of the people can hardly be estimated. A forest or park area of this kind located in every county of Iowa, is not an unreasonable thing to look forward to. After our park system is once established and in operation, we will wonder why we waited so long to provide these areas.

Hardly a county in Iowa is found without a suitable area for this purpose. The northern counties of the state have a wealth of lakes which should be among the first to be preserved for all time for the use of the people. These lakes are now largely owned by the state. The addition of even a narrow strip of land surrounding these splendid bodies of water would guarantee the use of these localities for the people as a whole. The expenditure of a small sum of money in proper maintenance and beautifying these areas would turn those which are not already in good condition, into parks which need not take second place to any similar areas in this part of the country. Many of the counties which are not favored by the presence of lakes, have beautifully wooded streams or hills or splendid geological features which should be set aside as state park areas before these are utterly destroyed. Any person who is acquainted with the various localities throughout Iowa, knows the extent to which timber, which has been growing from 50 to 200 years, has been cut. If these areas can be set aside and protected we will have at once a series of parks which might take a hundred years to reproduce if the areas are once despoiled.

These forested areas scattered over the state serve not only as recreational grounds but are factors in the ameliorating of our climate. In addition, for the satisfaction of some people, it is necessary to look at these areas from the standpoint of their money value. The land dealer well knows the value which is added to the farm having a good grove of trees adjoining the farm buildings. It is well known that a farm so equipped will sell at a considerably higher price than a similar farm not so equipped. Is it not true that splendid park area in a county will actually add value in dollars and cents to the surrounding farm lands in that locality? It is hardly to be supposed that in a state as rich as Iowa where farm land values have doubled over and over again in the past few years, that we cannot afford to provide for the reservation of these relatively small forest park areas in the various communities.

Iowa has a wealth of tree species such as are found in few other localities in the world. To most people it would seem rather ridiculous to consider for a moment the possible extinction of certain tree species of Iowa. However, we have come very close to this point in connection with the most important evergreen tree which has been grown in this country. The white pine formerly found in considerable numbers in northeastern Iowa and as far west as Hardin county, is now a rarity. A few small patches of this timber are still to be found. In other places, isolated species are still in existence. At the present time the question

of extinction of the native trees of this species is left entirely with individual land owners. Many of these areas would come naturally in state forest parks if these are to be established. What has been said of white pine is true with other species such as the balsam fir. It would be nothing short of a crime to permit a policy to run which would cause the cutting of the last few trees of any important tree species, just the same as it would be indefensible for us to permit the extermination of quail or other birds merely through lack of interest in their protection.

A few years ago our attention was called to the rapid destruction of the giants of the tree world, the sequoias, in California. The very limited areas in which these giant trees, some of which measure 44 feet in diameter, were found, were in the hands of commercial timber dealers who were ready to convert these oldest specimens of living things on earth into dollars and cents. The people of the country rose up in protest against the entire destruction of these forests which have been growing for nearly 4,000 years, and it was through the efforts of the National Geographic Society that provision was made for taking the control of these lands out of the hands of private individuals. Even though we may not have tree species as interesting as these giants of the Pacific coast, yet we have our own native tree flora which is not to be duplicated in any part of the world and portions of which should be preserved for the generations which are to come.

In conclusion, it will seem that the state forest park area is desirable from many standpoints. Its aesthetic and recreational values cannot be questioned; its scientific value in the preservation of native flora will at least be appreciated by the scientific people of the state. In addition, its value for the conservation of game birds and animals is easily recognized and also its value from the business man's standpoint is readily apparent. The continuance of the state park program which has now been started, if extended to all parts of Iowa, will mark the beginning of a splendid period of development in this state, which will mean much not only to the people of today but those of tomorrow.

FORESTS AND THEIR RELATION TO STREAM FLOW.

By Thomas H. Macbride, President State University of Iowa.

Could our science by any plan devised guarantee this we should deserve, if we did not receive, the grateful homage of all the future. The report by Mr. Norton is but a beginning in this direction. Doubtless no one more than the author of that valuable paper recognizes the truthfulness of this statement. To know the truth in regard to deep wells, the extent of aquiferous beds, their sources of supply, their probable content, and the depth at which they must severally be sought is information of the most desirable and practical sort. But what of our supply of ground water? What of those superficial couches which give us the prairie spring, the long winding creek, our creeping rivers? In this direction lies a peril I believe for the state of Iowa today. There is in

my opinion no question as to the facts in the problem. Everyone familiar with the case will, I believe, assent that the state as a whole, is much drier than it was 40 or 50 years ago. It was at one time in all eastern Iowa, the common practice for each man to dig a well, for house or field, almost where he chose. A few feet below the surface, water was abundant. There is no such water supply now. Sloughs abounded from whose miry ooze the water seeped all summer long, and running water was found on every farm. There is no running water now; not because of dry seasons, but because of drainage. The insidious tiles exhaust the bed of the slough, and highway ditches on every square mile prevent all accumulation of surface water. Local rainfall is immediately carried away and has no time to soak down and fill subjacent porous layers. The soil has become dry, and for water supply the citizen must rely upon beds far down below, beneath one or more sheets of drift. This is one side of the question. Resultant from it, in part, appears another phenomenon, viz.: the failure of our streams. The creeks unfed, dried many of them long ago, except as flushed, sewer-wise, by the rush of surface storm-water, and the rivers are manifestly diminishing year by year. The sands and clays from ploughed hillsides are choking their channels, sealing their slender fountains. The stripping of woods and forest from river and hillside, from the rocky banks has all tended in the same direction. The water courses unshaded dry up in the summer sun. It is a fact often observed that trees by the highway keep the road muddy long after rain. To the same effect operate groves and thickets along our streams. The Platte river goes dry in summer; and yet the Platte river is fed by eternal snows. Shall the Des Moines, the Cedar and the Iowa, dependent on rainfall fare better than the Platte when their channels are filled with sand and all protection of forest and woodland have been stripped completely from their sides? As civilized men we have overthrown in all ways in flora, in fauna, in surface conditions an equilibrium which nature after numberless oscillations had established and it remains for us as a people to reach quickly a similar pacific state under new conditions with different species, different forms.

But it is said time will solve these problems; implying, of course, that time will solve them happily and right. But time, like experience, keeps a dear school, and the proverb does not commend the mental acumen of those who wait for such instruction. Besides, as just said, time has already solved the problem, and in that solution there is absolutely naught of hope.

Iowa is not a tropical island, bathed by ocean dews and washed by diurnal rains, where superfluous vegetable wealth forbids labor and denies the possibility of want; on the other hand, our prairies, although of matchless fertility, lie just on the limit of the region of inadequate rainfall. We have had, hitherto, just enough humidity and no more. Minnesota and Wisconsin are nearer the lakes, and Missouri, nearer the gulf; west of us are the semi-arid regions, once ominously called the American desert, whose hot breath even now occasionally invades our western and central counties.

I am aware that the competent director of our Iowa weather service takes the view that the climate of Iowa is a constant; that the rainfall

is probably also constant, taken one year with an other over long periods of time. This we may admit as true with the probable exception that our data, if sufficiently extended backward, might show a gradual, though very slight, decrease for all the western Mississippi valley. The average rainfall of the past eight years has been for Iowa as follows:

	Inches
1890	31.12
1891	33.13
1892	35.74
1893	27.31
1894	21.95
1895	26.63
1896	37.45
1897 (11 months)	24.98

We pass through seasons dry and wet; as Mr. Sage expresses it we have our "ups and downs;" but is it not plain that it is not so much the volume of rainfall in this part of the world as the amount of it, that in our processes of agriculture and elsewhere, we are enabled to use that must be considered? All that may be said in reference to constancy of our climate and the average uniformity of our rainfall may be granted, and yet I believe that the problem I have broached is a real one, a very real one, worthy the consideration of this body and demanding now the most serious attention at the hands of this whole people. The rainfall may be absolutely constant, or subject only to variations such as are continental, planetary if you please in origin, and yet the amount of moisture available for use in any particular locality for any given time may depend on causes which may be traced wholly or in great part to human agencies.

Such cases are, therefore, under our control. As I have already remarked, our methods of agriculture affect in profoundest fashion the recipient and retentive characters of the ground.

Permit me to carry my argument a little further. Our streams are threatened because we have cut off their sources of perennial supply. Omnipresent drainage and tillage has affected, is affecting, more and more their constancy.

The question of general humidity interests primarily the farmer, and the farmer is mainly responsible for present conditions and tendencies; but, the existence of our rivers effects those of the city perhaps even more than those of the field. Along the Iowa river for instance are Eldora, Iowa Falls, Marshalltown, Iowa City, and other towns of only less importance, all dependent upon the river for their water supply. The Iowa river rises in Hancock county. Until within a few years that county contained thousands of acres of marsh land, peat bogs, lakes, among which Eagle Lake was large enough to receive a name. What is the situation now? The marshes of Hancock county have been drained, the peat-beds support harvests of grain, and Eagle lake has given place to corn fields over which passes, autumn and springtime alike, the farmer's triumphant plow. The history of smaller tributaries to the river is precisely the same, all the way until it receives the Cedar and finally pours a

diminished flood into the Mississippi. The same thing is true of the Skunk river, the Coon, the Des Moines; and yet cities not a few are dependent more or less entirely on these streams for water. This is aside from all interests the farmers have in the streams, interest practical or theoretical. It may be said that the cities have resources; they may sink artesian wells. But we have yet to prove that this is practicable. In fact it has been tried in some places and found impracticable. But, wells or not, wet seasons or dry seasons, rainfall or no rainfall, Iowa cannot afford to become at any time absolutely desiccated if in any way such catastrophe can be averted.

But, you say, how is this matter to be remedied? Can we turn back the index on the dial-plate of time? No; it is not to be expected that original conditions can ever be restored. It is not even desirable to bring them back at all. Public interest, public sanitation would doubtless demand that the bogs be drained. Besides, some system of ponds or artificial lakes may probably be some day established, whose overflow may avail somewhat to replace the lost surface reservoirs which our agriculture has destroyed. More than this, if when we consider the fate of our streams we take into account at once the woodland and the prairie, there has been since the settlement of Iowa gain as well as loss. We have lost on the prairie, and aside from recent destructive tendencies have gained in the wooded areas. The second growth thicket is a much better retainer of moisture than were the primeval woods. These were in great measure open; they were fire-swept nearly every year, and the stratum of leaves, mosses, and humbler plants which in true forest conditions lie like a sponge over the whole surface, was entirely wanting.

Our new forest has been until recently, actually much more extensive, much more dense, much richer in leaf-mould and in every way fitter for the true work of a forest in the direction of determining the volume of local moisture. We have but to emphasize this advantage to equalize at least in some degree our manifest losses.

My argument then comes simply to this: I contend that the narrow measure of Iowa's woodland should as such be religiously preserved and in a thousand places extended. Every rocky bank, every steep hillside, every overhanging bluff, every sandhill, every clay-covered ridge, every rain-washed gully should be kept sacredly covered with trees; every gorge, sink-hole, should be shaded, every spring be protected, every streamlet and every stream and lake bordered and overshadowed. In short every foot of untillable land, and even a little more along creek and river margins, should be clothed with woods, should be woodland, land not devoted to pasturage at all, but land devoted to woods for the conservation, as far as may be, of the state's supply of surface moisture. By the voice of all authority, by the teaching of all experience, by every presumption of science such treatment of Iowa lands and such only is rational, wise and hope-inspiring for the future.

But now the edict has gone forth that the woodland must be cleared; every forest must be hewn down. We are told over and over again that Iowa has less waste land than any state in the union, that she has hardly an acre that may not pass under the plow; and in our effort to

make good our boast we are in danger of committing irretrievable damage upon what was indeed the most magnificent heritage of this whole Mississippi valley.

I have left out of view in this argument entirely the aesthetic side of this question, the necessity of streams and lakes and woodlands to the aesthetic side of human nature. The absolute need of the milder healing influences of natural beauty to our eager, anxious, overworked, care-burdened, gain-seeking people I have elsewhere found occasion to discuss. Nor have I touched at all the sentimental side to the problem. I have said nothing of Iowa as a home, as a land suitable in which to rear generation after generation of wise and happy children who shall grow up to love the place of their nativity and nurture; I argue now only for Iowa as a field, a great field enclosed by wires from which may still be forwarded train-load after train-load of corn and beef. The drainage of our prairies, the destruction of what little woods we have, these two things do, in my judgment threaten our wealth, threaten our hope of gain, and therefore ought to command the attention of our people to any reasonable discussion of the question and to commend any effort made to attain a definite knowledge of the truth.

But no sermon is complete without the application, and the question now rises what can the academy do in these premises? We can in the first place investigate. Scattered as we are over the broad domain of the state, we can, as we prosecute other lines of inquiry, likewise observe the facts that bear upon the problem here presented. Perhaps the geological survey has already such a line of investigation well in mind. It would surely very properly supplement the discussion of artesian waters. More than this, as we accumulate information, we may take pains to disseminate the same. I am of the opinion that this academy might, with advantage to itself and the public, largely increase its membership and so widen its influence, and thus eventually reach our myriad several communities, the ultimate sources of power.

Possibly the legislature might be induced to hasten such investigation as the situation would seem to demand. A year or two since we petitioned the legislature to take steps for the preservation of our lakes. I am not informed that the legislature ever considered the matter at all. But, however willing the legislature, the problem is too far-reaching, too intricate, for their action. What can the legislature do? Shall the state own the rivers and their banks? This might avail in Germany but is not once to be thought of under our democratic system. We must reach the communities. The people interested must own the wooded banks and rocky bluffs. Is it not to the interest of the city of Des Moines to own the sources of the Coon, the wooded banks and hills that protect its streams in summer? If New York City can own large watersheds of the Croton, and if the state of New York may sustain the Hudson valley by the magnificent Adirondack forest reserve; if the city of Boston may absolutely govern in all problems topographic, all the surrounding country, shall not the towns of Iowa find it to their interest also to protect by every means our meagre streams and scanty woodlands? Nay, may not all the people, locality after locality, be brought to see the true condition of affairs so clearly that the people will themselves,

community with community, and neighborhood with neighborhood, combine to the accomplishing of a purpose so beneficent, so absolutely essential to the continued prosperity of our people?

Some of us have seen county after county almost across our state pay a heavy assessed tax for the construction of a railway deemed necessary to the country's development. A movement such as here contemplated would be cheap in comparison, as regards the first required outlay, and would return dividends not, as too often in the other case, in vexation, litigation and disappointment, but in ever-increasing profit, pleasure and benediction upon ourselves and our children. The cost would be wholly inconsiderable.

The people would act today if the situation were clearly understood. The question is whether we do the right thing now or wait until the expense shall be increased a hundred-fold. The preservation of springs and streams and forests will one day be undertaken as freely as the building of fences or bridges or barns. When that day comes, Iowa, once so fair in her virginal beauty of wild-flowered meadow and stream-washed grove, now so rich in all that comes from tillage and toil, will put on yet an added splendor, in that all her toil and tilth shall yield to wisdom's guidance; forest and meadow receive each in turn intelligent and appropriate recognition; beauty become an object of universal popular concern, and once again across the prairie state the clarified waters of a hundred streams will move in perennial freshness toward the great river and the sea.—Iowa Academy of Sciences, Vol. 5, pp. 16-23.

RELATION OF STATE TO NATIONAL PARKS.

By Frank H. Culley.

In this magnificently conceived national park system of ours there has been reserved a very definite and a very valuable place for the state parks. Before discussing the relation of the state parks to the national park system, it is quite essential that we understand fully that the public lands which go to make up this system are owned and controlled in the main by three distinct political units; first, the nation; second, the states; and third, the municipalities.

Under the control and ownership of the nation we have such public lands as the national parks, the national forests, the national monuments, Indian reservations, military reservations and the great national highways. The state, generally speaking, has more or less direct control of all the public lands in the political units that go to make up their rural communities. The state then controls such public lands as state parks, state forests, local scenery reservations, water shed reservations, roadways, school grounds, cemeteries and church grounds found in the rural districts. While the municipalities have within their own boundaries park systems containing rural parks, on their outskirts; large city parks; neighborhood parks; school grounds and play grounds; cemeteries; waterfront developments; town commons and squares; all

of which are tied into one continuous system by means of their boulevards.

The national park system is comparable in its organization with that of the municipalities in that it is made up of all of these various units, regardless of their ownership and control, before mentioned, starting with the national parks and continuing down through to the smallest unit within the municipality. This whole group of disconnected areas is in turn to be connected and made into one great park system by means of a net work of national, state, county and local highways and municipal boulevards.

Professor Frank A. Waugh, who has been influential in forming the national park policy, has the following to say relative to the factors that should determine the selection and location of these parks.

"The national parks are destined to play a very important role in the future development of America. If we look at civic art from the national standpoint, they are of prime importance. These national parks should be established in various parts of the country, their location being determined primarily by the desire to preserve spots of national historic importance, or with the intention of preserving typical examples of natural scenery or special more or less spectacular features of national importance. The Yellowstone Park in Wyoming is a fine exemplification of this idea. Niagara Falls and its environs ought to become a great national (really international) park, and this again illustrates the idea distinctly. The battle ground reservations at Gettysburg and Lookout Mountain give examples of areas reserved on account of their historic interest.

"Should we secure an adequate park reservation in the White mountains or in the Adirondacks under federal control, this would be an example of a park in which would be preserved fine types of natural scenery. However, we ought to present in the same way the equally beautiful scenery of the sea coast dunes, of the great interior prairies and of the arid deserts. All these scenery types are beautiful, valuable and highly important. They cannot be permanently kept for succeeding generations in America unless they are appropriated by the national government and administered in behalf of the whole people. The time should never come when the people of the United States cannot have access to the great and beautiful landscapes which make America what it is today.

"Other and similar reservations, however, are needed under state control. There are many spots of natural beauty, many types of fine native scenery, many places of historic interest in every state, which are especially valuable to the state itself. Though these should all be preserved, they may not be of such national importance as to justify the federal government in patronizing them.

"Besides this, however, even the local community has similar opportunities. The smallest and poorest town has also its spot of historic interest, its types of beautiful scenery, its picnic grounds, its lakes and hills, which should not be allowed to pass into private control. Rather should they be acquired by the public and kept open to all the citizens

of the town. This is a matter of great consequence which is being widely neglected.

"The items most communities need to look after in this way are: A, ponds and lakes, which ought either to be owned in toto or should be accessible through the ownership of shore properties; b, river shores; c, mountain tops or hills commanding especially good scenery; d, small streams, brooks and water falls; e, rocky glens, caves, etc."

In the way of figures we might state today we have for example, 9,773 square miles of national reservations known technically as national parks; and 242,000 square miles of national forests. These two alone give us very nearly a quarter of a million square miles of national recreation grounds. The aggregate today of all publicly reserved lands is very nearly 200,000,000 acres or about two acres per capita. With these figures before us it is of timely interest to note that by far the greater portion of this great park land is owned by the nation and municipalities, leaving a very small percentage owned by the state.

We must have more state parks if we are going to uphold that portion of the great system of national parks for recreation and play that has been allotted to the states. The state reservations are those destined to best serve the greatest number of people intimately. The reservation of state parks is an important matter and one which opens up to us the next great field of progress and one which is upon us right now. Build now for the future.

ACTION NEEDED IN CONSERVATION.

By Fred J. Lazell, Author.

During the fifteen years the Iowa Forestry and Conservation Association has been in existence it has been pleading with the state officials and the state legislature to save some of the beauty spots of Iowa from destruction. Included in its membership have been leading scientists, farmers and horticulturalists of the state; some poets and now and then a man versed in the ways of politicians. With united voice, these members have pointed out the need of conserving at least a part of that natural beauty of which the state once was so proud. They have urged that some of the state's most beautiful lakes be conserved and their natural beauty enhanced rather than diminished. They have pleaded for the protection of forest coverings on some of the noblest elevations and in some of the charming valleys. They have asked for the conservation of the state's wild flowers; for greater protection to its birds. They have pointed out how all this might be brought about by the purchase of tracts of 50 to 100 acres of scenic beauty at each of, say a dozen different localities throughout the state. And they have shown that these state and county parks would not only preserve the scenic splendor of the state and afford protection to desirable forms of vegetable and animal wild life, but would also afford natural parks to which the people of the surrounding towns and townships might go for rest and recreation.

Meanwhile the progressive cities of the state like Des Moines, Cedar Rapids, Sioux City, Davenport, Dubuque, Council Bluffs, have spent mil-

lions of dollars purchasing and developing parks for the people. Life in the cities is far more enjoyable than it used to be because men with vision and good judgment have provided these places of beauty and freedom where tired workers may find rest from their labors and healing for their hurts suffered in the battle of life. But there have been no such men of vision in the Iowa legislature; or if there may have been one now and then, he has found it impossible to impart his vision to the men who listened coldly, and sometimes impatiently, while he tried to describe for them some of the most notable bits of beauty here and there in the state and to give reasons why they ought not to be despoiled but to be passed on more beautiful to succeeding generations.

A member of the present Iowa senate wrote me less than two weeks ago. He said that he had hoped to get support enough for a measure to appoint a legislative committee of five to select at least one little bit of beauty for a state park and with an appropriation large enough to purchase the spot that seemed to offer the most for the money. But after interviewing a number of the senators, he gave it up. It was like trying to kindle a campfire with wet wood. They could not catch the flame of his enthusiasm. He could not interest them in any bill that carried an appropriation. They talked economy. This, like all other general assemblies is to be one of economy and in the end, we shall find as we have always found before that it will spend more money than any previous legislature and will waste enough to buy two or three state parks.

The state spent \$50,000,000 last year. Of this amount, \$19,000,000 was spent for education and \$10,000,000 for good roads. That was fine and no one has or should have complaint to make. But it would not take \$10,000,000, or even \$10,000 a year to buy a tract of scenic beauty like the Backbone in Delaware county, or the caves in Jackson county, or Bixby park in Clayton county, a Wildcat den in Muscatine county, or the Palisades in Linn county, or Steamboat Rock in Hardin county, or the Balsam fir grove in Allamakee county, or Woodman's Hollow in Webster county, and to keep one or two men in each of them to prevent their further spoliation and to protect the fish and game within them.

A year ago, Governor Clarke made a ringing address to this association in which he called attention to the deplorable loss of animate and inanimate beauty that once made the state so famous. He declared that there should be a voice going up and down the state, like John the Baptist of old, warning the people against the loss of that which every good citizen should hold dear and pleading with them to conserve the fine old forest trees, the wealth of blossoming shrubs, the great sheets of prairie flowers spread in splendor among the billowy grasses and the little lakes that made homes for the wild fowl and made some of the counties of Iowa as beautiful as the lake country in England which was made famous by a whole school of poets.

That has been done. There have been, not one but many voices going up and down the state during the past year, some of them far sweeter and more persuasive than the voice of the prophet by the Jordan. The Iowa Federation of Women's Clubs has a special division of natural scenery and a number of good women, such as Mrs. Whitely, Mrs. Mc-

Nider, Mrs. Ames, Mrs. Taylor, and Mrs. Sawyer, have done splendid work along the lines suggested by Governor Clarke last year. Women's clubs all over the state have taken up the work. Several of them have nature departments. In Cedar Rapids the nature department of the Woman's club is the biggest and most popular department of the Woman's club. And the same men, members of this society and others, have continued to plead, as they have been pleading for many years, for the conservation of Iowa's wild life and beauty until I verily believe all this good missionary work has converted practically every thinking man and woman in the state, with the possible exception of the members of the present general assembly.

Seriously, I believe that what is most needed now is a voice to cry aloud to the legislature. Let him tell the senators and representatives what other states have done and are doing and plead with them to put Iowa where she belongs in the procession of progressive states. Let him dwell for a little while on the fact that corn and pork and dollars are great assets but that after all, they are only a means to aid the people to reach higher levels of culture and enjoyment. And then let him tell the legislature what several of our sister states are doing. Practically, all of the states of the east have long had state and interstate parks. Many of the western states are awake to their opportunities and aware of their responsibilities. Minnesota has her magnificent Lake Itasca Park, Wisconsin her beautiful Glenn Park directly opposite the proposed national park at McGregor. Minnesota and Wisconsin have a famous interstate park at the Dalles of the Saint Croix and Wisconsin has made a park of her own at the Dalles of the Wisconsin, and has several other state parks.

These are but a few instances of what other state legislatures are doing. It is time for the Iowa legislature to do something for Iowa. I sincerely hope that our legislative committee which is headed by Representative Horchem, will be able to induce the legislatures to make a start in this great work. A very small—almost an infinitesimally small increase in the levy would be sufficient.

Magnificent work has been done in placing the proposition for a great national park at McGregor before the people of this and other states. For aid in this work, this association is much indebted to the Iowa Federation of Women's Clubs, and especially to the conservation department of the federation. Not only have the members of this department given many addresses and written many articles regarding this park but they have helped to defray the expenses of similar work by other speakers and writers.

We hope that the national government will accept the recommendation of the agent of the department of the interior and set aside 14,500 acres of the sublimest scenery in Iowa and Wisconsin for a national park. If that is done the state ought to acquire some other strips of timber lands near by, especially some of the Oneota river valley. And if it is not done by the government, then Iowa, herself, ought to acquire this beautiful park and join with Wisconsin's Glenn Park in a great interstate park on both sides of the Mississippi.

The efforts of the state fish and game warden to conserve the wild life of the state by leasing thousands of acres of land adjacent to the streams and lakes, and endeavoring to restrict shooting on such areas is practical conservation work which all of us will commend.

I am also heartily in sympathy with his efforts to have the state purchase tracts of timbered lands on the river bluffs and flood plains so that the public may have free access to the streams instead of being barred out as trespassers. I hope that the association give its cordial support to this movement.

And I hope that some provision will be made, either by the addition of trained foresters to the warden's staff or in some similar way, to care for the forest coverings of such tracts and to prevent vandalism as well as to enforce the state fish and game laws.—Iowa Conservation, Vol. 1., No. 1, pp. 6-7.

STATE PARKS AND PUBLIC WELFARE.

By G. C. Morbeck.

All normal persons crave some form of recreation, and require relaxation from the more or less strenuous life they are living in these times. Most of them are interested to a greater or less extent in nature in one or several of her numerous manifestations. They enjoy the trees, the flowers, the hills and vales, beautiful scenery, animal life, the awe inspiring natural objects, as well as the minor interesting things to be observed in the great out-of-doors. Healthy recreation is a great asset to any community. We are living in an age when playgrounds are demanded, not only for the young but for the mature as well. In the larger towns and cities play has a regular place in the curriculum, and is supervised by competent instructors. For older persons no form of organized public recreation is provided.

A well developed system of state parks, well located, properly equipped and supervised, will supply this much desired need. We have in Iowa a large number of various sized tracts, generally wooded, which are well suited to park purposes. Most of them can be acquired at low prices at the present time.

To bring these latent recreation grounds within the reach of the people of Iowa is a public duty. To safeguard the health and provide wholesome recreation for its citizens is of the utmost importance. Millions of dollars are spent annually by the people of the country in seeking health, recreation and pleasure in the various natural beauty spots of the nation—the national parks, national monuments, national forests and other places of lesser importance. The interest in these government resorts is growing rapidly, as it well should. The wonders of nature here found are incomparable. All who can should behold them; having seen the giant trees, the great seas of granite, the roaring waterfall, the glistening glaciers, the gaping chasms, the spouting geysers and the numerous other unusual natural phenomena, one does not usually return; yet each year the lure of the wooded hills and the falling water is strong

within us, and we yearn to get away from the worry and care of the busy life of the city, town or country. Why not then, so far as we can, bring the beauty spots of Iowa close to the people and provide places where annual pilgrimages may be made at slight expense, and thus draw thousands of people from their busy lives, for a few days or weeks, to the beautiful wooded hills and vales of their native state?

Iowa was once forested to the extent of 20 per cent of her total area. At present about 7 per cent of her area is tree clad. The forests of the state lie along the streams for the most part, but in the east and north-east heavy timber also grew on the uplands. The proposed state parks are mostly in the wooded portions. A few in the north and northwest counties embrace lakes with little or no timber adjacent. It is proposed to perpetuate a number of the more extensive and picturesque tracts of forest land, especially those containing other natural objects of interest, such as rocks, cliffs, caverns, hills, valleys and streams, areas of rare flowers, shrubs, trees, etc. It is greatly to be regretted that all the original forests are gone and only the remnants remain as a heritage to us. Under state management, however, those included within parks may be gradually restored to their former grandeur.

It is in such places that it is proposed to establish recreation grounds for the people of the state. They are easy of access—yet have all the appurtenances of the wild woods and the silent places. Little improvement work should be necessary. The tracts should be left as far as possible in their natural condition. Camping places should be provided, and the necessary rules and regulations established to insure proper conduct.

The areas already tentatively selected for park purposes, are well scattered, and persons living in any part of the state can reach one of them and get well settled in a day's time. During the summer season, when the parks will be most used, the highways are in good condition and camping parties traveling by automobiles can reach their favorite outing places in a comparatively short time and enjoy their stay to the utmost.

State parks will also provide refuges for much of our rapidly vanishing wild life—flowers, birds, and animals. They will be ideal places in which to foster new species, especially of game birds and animals, since they will be amply protected at all times, and they may be the means of restocking the state with native and introduced birds and animals, and thus revive a sport now almost extinct.

Areas of historical importance should, by all means, be acquired for park purposes. Fortunately these tracts are mostly wooded, have much scenic beauty and contain natural objects of great interest in addition.

Let us all boost for state parks. they are essential to our public welfare and should be established without delay. Let us follow the example of our neighbors to the north and east, and provide outing places and recreation grounds for the people of the state. Wisconsin has many state parks of large size, some of which are well developed for recreation purposes. Minnesota has Itasca park, through which has been built excellent highways making it readily accessible, and hence greatly

enjoyed by thousands yearly. Michigan has its state forests, which, where possible, are made available for outing purposes. Let us have state owned recreation grounds in Iowa. We have made a start in the right direction, let the good work be carried through to its logical conclusion, and Iowa will ultimately have a state park system of which it can well be proud.

THE PLACE OF OUTDOOR RECREATION IN OUR MODERN CIVILIZATION.

By L. H. Pammel, Botanist.

When I prepared this program, the above topic was selected for the purpose of placing emphasis on the great out of doors. Our modern civilization is so rapid that we almost forget the finer things of life. That there is real need of giving more attention to the great out of doors is apparent on every hand. The business man working all day in his office, store or factory needs the refreshing stimulus from nature. The farmer at the plough share and busy in the harvest field needs the recreation so necessary to invigorate his life. The woman of the city at the office desk or the toilsome saleswoman, who labors in selling goods over the counter, the busy housewife of the farm and city, all need the good they can get from the great out of doors. These people will be rejuvenated, if they can only spend a few days in some convenient place in woods and meadows.

The glorious sunshine not darkened by the smoke of factory and mill, can only be had away from the city. The shade of the great oaks, elms, maples and basswoods is much more refreshing than the shade trees of the city, where the hot sun radiates from the paved streets.

It seems to me the health of the community is of such paramount importance to the state and nation that something must be done for its citizens. The nation has wisely set aside large areas in the Rocky Mountains, the Pacific Coast, in Minnesota, the Appalachian and White mountains, as playgrounds for the American people and we owe much to the late Honorable John F. Lacy of Oskaloosa, who had the whole country at heart in providing for these national playgrounds. Major Lacy gave us far reaching plans in its bolder outline and left to his successors the plan to reach the smaller communities. Nearly all the larger cities have parks of varying size, a beginning in most cases, only has been made. We have now reached the stage in our civilization where these parks must be greatly augmented. Every county and city in the state must provide parks, where the daily toiler can find solace and comfort. The state must augment the work of the county and city and even the national government can well afford to nationalize these parks as it is proposed to do in the vicinity of the Mississippi Valley National Park, and why not?

We are now in the transitional stage in the affairs of our government. Witness, if you please, matters of importance connected with the war. Some matters which a year ago were thought to be purely a state matter, are now rightly considered to be a part of the affairs of

the government at Washington. If these things can be done in connection with our war work, I believe there is every reason for doing this also in the case of recreation places, because these are indirectly connected with the health of every community. The health of a nation is a direct asset for the government.

In our own state we have passed the pioneer stage of our development. Some of you can recall the strenuous labors of the father and mother. The pioneer had to work long hours to keep his family together and arrange for some of the comforts of life. Those of you of middle age can all look back with pardonable pride at the strenuous days of girlhood and boyhood. This pioneer work is done and it is for the present generation to provide these places of recreation. The whole business is connected with civic pride and I am glad to note that every where in Iowa, the matter of looking after parks and streets is receiving more attention. More and more the different communities of the state pride themselves on keeping nicely kept lawns and streets. However, there is still room for improvement. The weeds of the roadside should be kept down.

There is another phase to the subject which I want to call attention to, namely, the educational value, or let me say the cultural value. The form of culture as the botanist understands it, is full of inspiration to the investigator, the searcher after truth. The fields and meadows are filled with great possibilities. The Mexican cosmos adorns my yard as one of the really beautiful plants of cultivation. I have found in my experience in the state of Iowa, that in recent years there has been much interest in the study of the wild plants and preserving them to posterity. In my boyhood days on a Wisconsin farm, the moccasin flower, shooting star, columbine, pasque flowers and many others were looked upon as weeds. Some of these plants are no longer found on the old farm. An appreciative soul can only enjoy these humble plants of the woodland and meadow. The little child that gathers these plants has a keen sense of culture, I think.

A few years ago a very remarkable naturalist passed away. I suspect that this naturalist knew little about Latin or Greek. I am sure he must have known something about English and American classics, otherwise he could not have written such delightful books on glaciers and Yosemite. In his last book, "The Story of My Boyhood and Youth," he wrote: "From the top of a hill on the north side of Lake Mendota I gained a last wistful, lingering view of the beautiful university grounds and buildings where I had spent so many hungry, happy and hopeful days. There with streaming eyes I bade my blessed Alma Mater farewell. But, I was only leaving one university for another, the Wisconsin university for the university of wilderness."

The wild and awful storms that thundered on the black headlands and craggy ruins of old Dunbar, where the sea and sky, the waves and clouds mingled together gave him inspiration. It was the beginning of that cultural training that made him a great naturalist.

Muir's first view of the lovely valley left a deep impression on him. He says: "Looking eastward from the summit of the Pocho Pass one shining morning, a landscape was displayed that after all of my wanderings still appeared as the most beautiful I have ever beheld. At my feet

lay the great central valley of California, level and wide, five hundred miles long, one rich furred garden."

On the value of a study of trees, shrubs and flowers as a part of a cultural education, my good friend, Dr. Macbride, one of the nestors of this association, has well said: "You who have been effecting the classics know, of course, that our present use of the word is entirely a figure of speech. Culture, to start with, meant the care and development of a plant. This significance still lingers in agriculture, the cultivation of the field—that is, of what grows there—horticulture, the tillage of the hort-yard or orchard, as we say, and so on. Thousands of years ago men found that if they took a little care of a plant, gave it a good place on which to grow, with plenty of air and sunshine and water, the plant greatly changed, offered new characters, or at least new phases of the old; the smooth-leaved wild mustard of Europe, on cultivation, took on the form of cabbage, became a cabbage head in fact; the green, tough fruit of a Persian shrub became a peach; the sour crab, an apple; the wild grain, wheat; and so on; all this thousands of years before men had ever written a word. Small brown men, as I think, away back yonder in the forgotten years, in the childhood of humanity, made wonderful discoveries; they discovered the culture of plants. So it happened that when, at last, men did begin to think and to write, the culture of plants had long been familiar as to you and to me.

"As compared with the story of the plants, Cicero was a modern. He looked out upon a civilized world and, full of genius and wit and all accomplishment as he was, it occurred to him to compare the mental experiences of men with the history of the plant; and so the famous orator flashed all the mystery and the beauty of those natural, visible processes among the plants into the richness of one fine metaphor '*Culture animi philosophia est*'—philosophy is the culture of the soul."

PRESERVATION OF PLACES OF HISTORIC INTEREST IN IOWA.

By G. Perle Wilson Schmidt.

The importance of preserving places of historical interest seems as obviously necessary in our big rich commonwealth of Iowa as any place in the United States. But if we are to receive the necessary support for such a move, we have first the task of creating the feeling among the residents of the state the significance for such a movement. To make the people feel that we too have history vital to future development and coming generations if we are to maintain the same equilibrium and stable status of enthusiasm for their native state as the eastern states have done, this work must fall upon the shoulders of intelligent and enthusiastic citizens in every locality in the state.

Many people say, "You have no history in Iowa," and how hard it is sometimes for us to try to prove the fact that we in Iowa do have history, potent history, and that we are doing much more for the preservation of this history than any outsider realizes. How about our Floyd monu-

ment at Sioux City which commemorates the longest and one of the hardest expeditions the world has ever known? The Spirit Lake massacre with its horror equals the massacres through which the white settlers of New York state and other eastern states passed. Some of these outstanding places have been marked, but these mark only the beginnings of properly preserved Iowa history. Plymouth Rock did not have history till the Pilgrims set foot upon it. Neither did Boston in the beginning. These two places may well be classed as the keystone of American history. Why? Because this history has been preserved and its preservation has been kept constantly before the people throughout the country.

It has been little more than one hundred years since actual preservation of historical places was begun by some of the states which are so fond of pointing out this lack of state history to us. One hundred years ago Iowa had yet to make her history, and now she has a history comparable to that of other states, and she has now but one thing to do to prove it; that is, to conserve and cherish these places with pride and credit to the soldiers of fortune, the pioneers who have made history for us. Let us hope our present generation may be fully alive to the fact that it is now or never that this work must be done. We must teach the younger generation to appreciate this history and the importance of preserving it and handing it on to future generations.

In many instances places of historical interest to a given local community have been lost, and I believe that an attempt should be made toward stimulating local preservation before more is lost. One of our historians has to my mind illustrated the cause for this neglect throughout the entire West by the following statements which may well apply to Iowa alone. He says that the West may well be likened to a busy housewife. It is early morning. She has fed her family and gotten the children off to school and is in the midst of her morning dishwashing when she hears a knock at the front door. Hastily she wipes her hands on the corner of her apron and without a glance in the mirror, rushes to the door to find friends from the east have arrived unannounced. Unhesitatingly and whole-heartedly she welcomes the comers. She leaves her tasks planned for the day and prepares a feast of good things for the table. The richest cream, golden butter, and the best of fried chicken vie with each other to please these fastidious guests, nor is there any evidence of anyone partaking sparingly. Late in the afternoon as the tired woman closes the door upon the departing guests, she is amazed and wounded to hear: "So unrefined—such a lack of culture."

The author of the above analyzes the statement thus: The West has been so busy attending to its own business of feeding the world and building up commercially that she has not acquired many of the so-called social refinements of life. But that time has now passed with the "Wildness of the prairies." Manufacture and business are now firmly established and Iowa can and must advance socially as well as economically. What better foundation can this advance rest upon than the preservation of places of historical interest. History is no longer the dead inanimate thing that those who seek only worldly wealth would have us think. History is the foundation of life itself. Without past history we should

have no art, no music, no literature. Economics and politics are but the outgrowth of the past social organization of life.

Plainly, indeed, it seems to me we of Iowa can well afford time and money to place before our coming generations visible evidence of our faith in those who bore and suffered the trials of conquering the untrodden and untried problems of placing civilization in what is now the state of Iowa.

Being a native daughter of Iowa and having been taught state patriotism through the recital of the struggle of pioneer days, I know of places individually I would like to see preserved by some sort of mark. Not long ago a friend who has grown up with the same sort of inspiration as I have, wrote to me asking what I thought of marking certain places on the farm of his childhood, places which have had an important part to play in local history of that community, (Bennington township, Black Hawk county). One of the places I will mention is a group of immense boulders one of which has a flat top perhaps ten or more feet in diameter, which stands on the crest of a hill. On account of its location, this place was a camping place for pioneers and settlers crossing the flat plains over the untried road of fortune and home finding. My reply was: By all means have that place marked—it may be half a mile from the road, but a flat plate imbedded in concrete and placed in the top of the rock, telling of the fact and mentioning names of those who camped there would create an interest in that place that the grandchildren and great grandchildren of those selfsame settlers will go to see. It will inspire within them something I am sure they never knew or thought of before, and that something will be a truer state patriotism as they begin to ask why it was done and read the names of their ancestors on that plate.

Last year a friend of mine spent time in trying to excavate a mound near Nevada, Story county, but bad weather and frost prevented further investigation. The removal from the state of this person has precluded further investigation from that source unless others duly investigate. On our own state college campus, the one or two reliable remaining authorities tell me there are two places which can well be preserved; one is the old trail which crossed the prairie to Boone, another is the place near our college cemetery where the barbecue and picnic were held celebrating the giving of the grant of land for the Iowa State College.

In and around Ames itself are several spots of local interest which I feel should be marked if we are ever to create an atmosphere of local history. One is the placing of a plate, either on the wall of the North-Western station or in the sidewalk, containing the authentic date of the arrival of the first passenger train through Ames. Hundreds of passengers go through here every day, and why can't Ames, the center of so great an educational institution, help inspire thoughts of historical interest as well as thoughts of commercial activity?

One cannot visit the state university without feeling the atmosphere of historical interest which permeates that place. The very fact of that beautiful old state capitol upon its grounds gives impetus to historical preservation. I am a believer in "History beginning at home," and my heart is rapt in methods of inspiring local preservation. In that spirit several hundred questionnaires have been mailed to pioneers and their

descendants in the hope that we may accomplish something ultimately for Story county history, though the way seems long and hard and it may be many years before those who have been working faithfully the past four years see the vision become a reality.

Then here's to the pioneer so brave.

To the pioneer with his will of iron strength
Who traveled the road of unknown fate

To the end of its weary length.

Here's to the pioneer who grimly faced

Grim stalking death by Indians, beasts, and the elements,

O Pioneer! We bow to you

With hearts full of love and reverence.

CONSERVING OUR BIRTHRIGHT.

By Zellah M. Schermerhorn, Ph. D.

In this age of specialization, all effort seems to have been directed toward the increase of efficiency.

Everywhere you look efficiency is the one word posted and everywhere you seek you find all effort devoted to acquiring greater and still greater efficiency.

Manual training, economics, business courses have become an intrinsic part of the curriculae of all our graded and high schools, our universities and colleges.

Our great leaders and teachers have recognized the fact that the mind of man longest retains the impressions and lessons of youth, and the lesson of greater efficiency has become the basis of our education.

But there is one field which has been sadly neglected, and that field contains more powers for greater efficiency than all the others combined,—nature and nature studies. A field planted by God's own hand and given over to man's dominion. That field of bluff and crag, of trees and shrubs, of flowers and grass, of feathered, furred and finny creatures, all playing a specific part in the general plan of life, all having a direct bearing upon the past, present and future life of man. All our inherited birthright; all ours; not ours to destroy and exterminate, but to preserve and to use.

Each unit of all creation has its own specific meaning, use and message, but we have not taken the trouble to interpret and thus to know and properly use our birthright.

In the great out-doors there lies wonderful unwritten histories of the past, great assistance for the present, grave warnings for the future, and we pass them by. We do not think it worth while to gather knowledge of these things close at hand because we have never sought their lesson and their use.

The naturalist, the botanist, the geologist, the ornithologist have been the butt of the rude humor of the ignorant for many long years and yet,

from their patient struggle against great odds, have come some of the greatest blessings of our modern life.

True, we cannot all be naturalists or geologists, but we can learn from them much that would make each little flower, each bird and beast, each pebble at our feet, a companion and a friend.

Bravely these men and women of understanding have gone on filling case after case in our museums, writing volume after volume, working and pleading for reservations of land, timber and water, until today, we are recognizing the fundamental truth of their arguments and the usefulness of their plans.

There are very few people in America who have not some love for the great out-of-doors. There are very few who know anything about it and there are very few who do not listen eagerly when a tale of nature is told. Little children are most susceptible to nature's influence and because they are yet close to her and unmarred by worldly contact, their understanding is often superior to that of the adult. Once they know and understand nature's message, they become nature's protectors and communicants. They revel in their knowledge and its inspiration is constructive.

An instance is well worth reciting:

Not long ago a lady was visiting the museum in the Iowa State Historical Building. Four small ragged, dirty boys were likewise going from case to case. But as they went, they would inquire one of the other "Hey! what's that thing?" Invariably the answer came in true young American fashion, "Search me." The lady thinking to please these urchins of the streets, ventured to say "Hello, boys." Quickly the answer came, "Hello, lady. Say, what's that thing?"

The thing in question was a specimen of Iowa's coral. The story of the coral and its buildings was told in answer to many eager questions and quaint comments.

These five went from case to case, the lady answering as best she could the many questions, building in each little mind a love of the beautiful and understanding of much that they saw.

At last they came to war relics and the lesson of destruction was taught. The boys were not as interested and enthusiasm lagged behind them, quick as a flash and by unanimous decision came this request: "Say, lady, we don't care about these things; they're only to kill folks with anyway. Come upstairs and tell us some more 'bout what we can find outdoors; 'bout the rocks, the big elephants what lived so long ago, the Injuns and them things they used to hunt with. Come on, lady, won't yer?" And back to the other floor they went.

For four hours they walked about and talked and childish faces gleamed with joy of knowledge of the great out-doors. When they parted at the door, one little fellow whose sparkling dark eyes looked out from a very dirty face, grasped her hand and said: "Lady! them's great. When summer comes I'm goin' t' hunt fer some of them things. Kin we come agin? Will you be here? Say, couldn't you take us some place and show us somethin' like they got shut up here?"

Plans for future meetings were laid and four boys went happily on their way. As they went down the outside steps, one boy said, "Hey,

kids, ain't nature great? Jist look at them big trees over there. Say I ain't never goin' to ruin nothin' more that God made. Are you?"

Boys on a bright, warm sunshiny afternoon, all thoughts of play banished, no mischief in sight, inspired with love and understanding, happy, eager to impart their knowledge to other boys and wanting to come again! Was it worth the lady's effort? Would it be worth the state's effort to provide places in the great out-doors for such as these?

If an afternoon with glass encased specimens means so much to our boys, how much more would a day in some forest reserve, along some river or lake shore, in some park set aside for their use mean to them?

Some place set aside where our boys and girls may learn to love, to protect, and to understand nature; a chance to gather knowledge to impart to others; the beginning of an endless chain of understanding, appreciation and re-inforced efficiency; young minds, so busy with the greater, sweeter things that they have no time or inclination for mischief, no time for quarrels!

Think you a young mind filled with love and understanding of nature will ever become a case of juvenile delinquency? Think you a man or woman recognizing the beauty, the usefulness, the wonder and the power of nature will ever go far astray in the journey through life?

In view of the great cataclysm of destruction just passed through, is it not well worth the state's effort, time and money to banish from the minds of our youth all cruelty, destructive tendencies and ignorance of nature and natural laws and create in their stead a love, an understanding and a constructive spirit?

It is truly the state's duty and solemn obligation to her youth to set aside the historical and natural beauty spots, the green carpeted forest, the banks of streams and the shores of lakes, and to make of them trysting places of man, with the birds, and beasts and finny tribes.

May the day speedily come when we will cease to make of the minds of our children mere cold storage warehouses for masses of information for which they have no use as they journey along life's way and no sense of their application if a use should develop.

If we would truly conserve, it would be well to remember that

"More servants wait on man
Than he'll take notice of."

NATIONAL PARK AND FORESTRY RESERVE RESOLUTIONS OF ACADEMY OF SCIENCES.

In view of the fact that there is now a petition before congress from the people of Minnesota asking the setting aside of certain tracts of timber land included in the Leech Lake Indian reservation in Minnesota, except such lands as have been allotted to the Indians in severalty, as a national park and forest reserve, for the purpose of conserving the timber and conserving the water supply of the Mississippi river, and in view of the fact that other tracts of timber lands in the northern part of Min-

nesota, Wisconsin and other states and territories in the union from which the timber has been removed, which have reverted back to the government, should be set aside for forestry purposes that they may again be covered with forest growth to supply coming generations; therefore,

Resolved, That the Iowa Academy of Sciences hereby petitions congress, first, to segregate for park and forestry purposes, the said tract of land at the headwaters of the Mississippi and such other lands as congress may have control over in the states of Minnesota and Wisconsin and other states, especially the Rocky mountain and Sierra regions, to the end that not only the timber supply of such states may be partially saved, but for holding the moisture in said regions, and also for the preservation of our wild game; second, we also favor the purchase of the land for a proposed Southern Appalachian National Park.

Resolved, Third, That the government from the market public lands covered with timber, that the mature timber on the same be sold under the supervision of a technically trained forester; fourth, That we urge upon our delegates in congress the feasibility of concentrating the forestry work; and urge that the government establish a rational system of forestry, especially with reference to our forest reserves; and fifth, That the supervision of these forest reserves be placed in charge of trained foresters, all under one responsible head, preferably the United States Department of Agriculture, to the end that a more rational system of forestry may be introduced in this country.

L. H. Pammel,

T. H. Macbride,

H. A. Mueller,

Committee.

ESTABLISHMENT OF NATIONAL FOREST RESERVES.

Resolutions of the Academy of Sciences.

The Iowa Academy of Sciences approves of President Roosevelt's message on forestry and irrigation, two great internal questions and heartily concurs in the statement that, "The fundamental idea of forestry is the perpetuation of forestry by use. Forest protection is not an end of itself; it is a means to increase and sustain the resources of our country and the industries which depend upon them. The preservation of our forest is an imperative business necessity. We have come to see clearly that whatever destroys the forest except to make way for agriculture threatens our well being." The usefulness of forest reserve has been demonstrated and to have them wisely and justly administered is therefore an imperative necessity. We heartily concur in the recommendations made by Secretary Hitchcock in his annual report that the forest reserves should be under the direction of trained foresters and that forestry, dealing as it does with a source produced by the soil, is an agricultural subject and should ultimately come under the head of the Department of Agriculture if found practicable, because of the trained foresters

in the department. This will be to the interests of the reserves and the people who use them. We heartily commend the action of Secretary Hitchcock in creating the Division of Forestry of the Interior Department and appointing men who are specially fitted to look after the management of the reserves, until such time as the forestry work of the government shall be under one management, the United States Department of Agriculture.

In regard to the grazing of sheep in our reserves we are glad to note that a more enlightened policy shall prevail. We commend specially the statement of Mr. Gifford Pinchot, that "wise adjustment of the grazing question must be a compromise founded on a just consideration of all various interests concerned." The resources of the forests should be wisely used and all matters pertaining to the forest and tributary country should be considered on its merits. We approve most heartily, also, the recommendation of Secretary of Agriculture Wilson in regard to the proposed Appalachian reserve which is urged in order to protect the headwaters of important streams, to maintain an already greatly impaired supply of timber, and to promote a national recreation ground which, with the single exception of the Adirondacks, will be readily accessible to a larger number of people than any other forest region in the United States.

Resolved, That the Academy of Sciences hereby petitions congress to take favorable action on the following recommendations:

"1. To set aside for park and forestry purposes the timber tracts of the Leach Lake Indian Reservation and other lands at the headwaters of the Mississippi to protect the waters of this great stream which have greatly diminished during the summer months. Also to conserve the immature white pine and other timbers so useful in the arts and industries. The cutting of mature white pine should be permitted under restrictions laid down by the interior department. We favor also the setting apart for similar purposes such other lands as congress may control in the states of Wisconsin, Minnesota and other states, to the end that the timber supply of said states may be at least partially saved or restored, and that the forests on such tracts may serve to conserve the moisture and to protect and preserve wild game in said regions. That congress take favorable action on the recommendations of Secretary Hitchcock with reference to the transfer of forestry work; since the concentration of forestry work is highly desirable to give stability and permanence to the management of the forest reserves.

"2. The purchase of land by the government for a southern Appalachian park in the Rocky Mountains and Sierra Nevada regions. We favor therefore, the passage of House Bill No. 3128 introduced by H. Brownlow.

"3. The withholding from the market by the government of public lands covered with timber and making provisions for the sale of the mature timber thereon under the supervision of a technically trained forester.

"4. The enactment of a law embodying the recommendation of Hon. Binger Herman, commissioner of the general land office, in his last annual report 'that all public lands which are more valuable for forest uses than for other purposes shall be withdrawn from settlement, entry, sale or other disposition and be held for the protection and utilization of the

timber thereon, in accordance with the provisions of the forest reservation law.'

"5. The adoption of the recommendation of the said commissioner of the general land office that the president of the United States be vested with the authority to reserve tracts of government land for national park purposes without approval or further action of congress.

—"Resolved, That the Iowa delegation in congress is hereby respectfully requested to urge the enactment of laws embodying the recommendations herein contained." Signed,

L. H. Pammel, Ames.

B. Shimek, Iowa City.

M. F. Arey, Cedar Falls.

—Iowa Academy of Sciences, Vol. IX, p. 17-8.

APPROVAL OF CONSERVATION.

Resolutions of the Academy of Sciences.

By virtue of the fact that there is now a general movement for the conservation of our natural resources, both by the national authorities and more recently by the state, therefore be it

Resolved, That the Iowa Academy of Sciences in session hereby reaffirm its indorsement of the general movement toward the conservation of our forests, rivers, lakes and mineral resources by the national government.

Resolved, That the academy wishes further, to voice its approval of the work already begun by our own state through its State Geological Survey and Conservation Board, and urge upon our state authorities the desirability of confirming and extending the work already begun by these.—Iowa Academy of Sciences, Vol. XVII, p. 5.

OBJECTS OF PARK AND FORESTRY ASSOCIATION.

The objects of the Iowa Park and Forestry Association are to create an interest in, and to encourage the establishment of parks; the beautifying of our cities; the better care of cemeteries; the planting of trees in country homes for aesthetic purposes as well as for the supply of timber for commerce; the proper utilization of our remaining timber-lands; and to assist in the inauguration of rational methods of forest management and thus help in the protection of our wild game and song birds; the creation of one or more state parks in the vicinity of our lakes and streams; to encourage state and national legislation for rational forest-management, and for the creation of more forest reserves.—Article II, Iowa Park and Forestry Association, Fifth Annual Meeting, p. 1.

MISSISSIPPI VALLEY SCENIC MATTERS.

Resolutions of Iowa Conservation Association.

Resolved: 1. That we most heartily endorse the plans for the establishment of the Mississippi Valley National Park, substantially as recommended to the Department of the Interior by its representative, M. L. Dorr.

2. That this association express its deep appreciation to the property owners around McGregor who have so well preserved the natural scenery of the region.

3. That the association appreciates the offer of Mrs. Martha Buell Munn to the Department of the Interior in November, 1916, to donate within two years, 150 acres of her property and hopes that in view of the intervention of the present war, Mrs. Munn's option will be extended a reasonable time after the close of the war.

4. That the association empower its officers to negotiate with the Historical Society of Iowa or the Historical Department of Iowa for the preparation and publication of the available data regarding the Mississippi Valley National Park.

5. That the association is in favor of the United States government establishing on both sides of the Mississippi river between St. Louis and St. Paul a series of parks and forest preserves on land not suitable for agricultural purposes for the conservation of our scenic and timber resources.

6. That this association is in favor of the retention on our statute books of the present law giving protection for five years to quail and prairie chickens in this state.

7. That we favor the prosecution of the campaign against the barberry and squirrel tail grass all over the state.

8. That we appreciate the courtesy of the McGregor Citizens' Association, the churches and all the citizens of McGregor in assisting the association toward making the McGregor meeting a success.

9. That we appreciate the invitation of the citizens of Waukon, Postville, Elkader and Clermont to visit their communities and regret that this invitation cannot be accepted on account of the delay of the program by the inclemency of the weather.—Iowa Conservation Magazine, Vol. —, p. 28.

WILD PLANTS AND
BIRD LIFE

Wild Plants and Bird Life—

BAILEY, B. H.

BENNETT, GEORGE .

BURGESS, MRS. E. A.

CLARKE, CHARLES F.

CONRAD, HENRY S.

CRATTY, R. I.

KELLOGG, HARRIETTA S.

STEPHENS, T. C.

SPURRELL, J. A.

TAYLOR, H. J.

WILD PLANTS AND BIRD LIFE.

THEIR PRESERVATION AND PROTECTION FOR THE BENEFIT OF FUTURE GENERATIONS.

THE AQUATIC PHENOGAMS OF IOWA.

By Robert Irvin Cratty, Naturalist.

So large a proportion of our state is suitable for cultivation that our native flora is being rapidly swept away, and while most of the species may survive along roadsides, in hilly and stony localities, and along streams yet many which are local or rare must eventually disappear entirely. Most of the land too rolling for plowing is valuable for pasturage, and here the destruction of the indigenous flora is nearly as rapid, the introduced grasses, clovers and weeds appropriating the ground. While the marsh and aquatic plants have a better chance in the struggle for existence than the prairie flora, yet the draining of ponds and marshes, thus greatly restricting the area frequented by such plants, is certain to sweep away some species which were formerly quite common. Those who have lived many years in the state, now see the former haunts of muskrats and aquatic birds covered with waving grain, and while from an economic point of view this change may be desirable, yet to the naturalist it brings the conviction that if we are to secure a full representation of what our flora was, there is no time to lose.

PRESERVATION OF WILD PLANTS IN IOWA.

By Mrs. H. J. Taylor.

It is not so very long ago that children were sent to college, and even to school, in the hope that they might not have to work as hard as the parents. Education was thought to lift one above the plane of work to a life of ease. Those who went to college were on a separate plane.

Today, education means larger vision, more tender heart, closer fellowship with all mankind. Today education and service go hand in hand and any school or college that is failing to fit its men and women for a life of service, is not fulfilling its mission. Education does not lift one away from his fellow men; it keeps him forever one of them, with a closer and clearer understanding of all their needs. Any education that is vital, broadens vision and holds us close to the pulse throb of humanity; helps us to see and do for others what they cannot see and do for themselves. Education makes us seriously and thoughtfully minded toward the

welfare of all mankind, not only for this generation, but also for the future generations.

Unless our schools and colleges are making men and women of vision and service, our country will go to ruin socially and will become a barren waste naturally. This association concerns itself primarily with the conservation of nature's resources. We are consuming and wasting nature's bequests to us, and thus impoverishing the world for the coming generations. We have already, beyond repair, impoverished the world in plant and animal life. It has not been wilfully done, just thoughtlessly and ignorantly. In some cases it has been done for financial gain.

We are beginning to realize the waste and wontonness we have practiced. The signal of conservation is being sounded all over our country. I am glad that Iowa, too, is sounding its bugle call. Because we are in danger of losing some plant species, our thought has been turned to the necessity of preserving wild plant life in Iowa. In the opening of new lands, the pioneer has struggled with, and faced many hardships in his race for existence. We owe a debt to those courageous souls, but they and their children would have been richer had they not left everything out of account that did not help to "make it pay." I went into Millette county, South Dakota, when the Rosebud agency was opened three or four years ago. I never saw more beautiful wild flowers. In speaking to two homesteaders I said: "You will see that these beautiful prairie flowers are preserved?" The reply was: "We are not concerned about flowers, we want this land to make us a good living." The spirit is too prevalent over our prairies "to get more land to raise more corn to feed more hogs," and it's a treadmill round that is grinding out men and women of small caliber.

The earth and the fullness thereof belong to man; not to destroy, rob, or impoverish, but to use and enjoy, remembering that the generations to follow will need the products of the soil, the trees of the forest, the fish in the streams, the birds for their song and beauty as well as economic value, and the inspiration of flowers and plant life. Nature stimulates the imagination of men and gives them visions beyond the reach of the natural eye and ear. Flowers, in the language of their color and fragrance, express for us thoughts and feelings that lie too deep for words. The delicate tracery of ferns has given inspiration to lace makers and craftsmen whether artists or architects. It seems as if some great grove must have been the inspiration for the interior of the Milan cathedral. Flowers have given the suggestion for decorating column and ceilings. We cannot afford to ignore the inspiration of nature's inheritance. The plow is driving many a delicate flower to struggle in some fence corner. The homesteader and pioneer need to see that wealth does not lie alone in what the soil can be made to yield. The house that contains only the things absolutely to sustain life, will always remain a house, it will never become a home.

The wild rose which grows on the uplands and lowlands all over this prairie state, is a beautiful and fit emblem for our state flower. It is delicate and modest, beautiful and blushing, yet so sturdy and strong that it can scarcely be uprooted. But not all plants have the range of soil and climate of the wild rose. The more delicate plants have their

particular haunts and will not thrive elsewhere. Many of these, from ruthless plucking are becoming rare, and in some cases, extinct in their localities. I was one of a small group that went out to gather trailing arbutus—that sweetest harbinger of early spring. It was in western Wisconsin, more than 30 years ago. Pushing aside the snow, we picked every flower we saw—no, we didn't pick the flowers, we pulled them up, root and all and came home with baskets filled. We called it a glorious day. It does not look so glorious now. In those Wisconsin woods, where once the arbutus was abundant there is scarcely a blossom to be found. Conservation had not sounded its note of warning.

Iowa has rather a wide range of flora. The wooded section along the Mississippi river has the characteristics of flora of the eastern states. On the bluffs about Sioux City, the beautiful, showy manzanita is found. This is, so far as I know, the extreme limit of this flower. The East and West seem to clasp hands over Iowa. Because of this very fact, many of our species do not grow in abundance and will need the more care to preserve them.

The purple-blue hepatica is one of our delicate flowers threatened with extinction. The same is true of the trembling anemone. I have seen nothing more beautiful in the vicinity of Sioux City than a patch—more than 100 feet square—of snowy bloodroot. Year after year we go out to let this wonderful garden say to us what it will. Rarely does anyone pick a flower. Such delicate purity and beauty speaks to the heart as not even the poet can. Abundant as the bloodroot is, there are localities where its life is threatened. There are places about Sioux City where bloodroot, diцентра, columbine, and jack-in-the-pulpit were abundant twenty-five years ago and today there is scarcely a trace of them to be found. This due to thoughtless, wanton plucking. Children pick all they can carry. In a few hours they are withered and thrown out. Would the loss from our roadsides and hills, of the purple and white aster, the bearded tongue, the butterfly weed, the fringed and closed gentians, not rob us of a language that speaks without words or sounds, to the heart and mind? Flowers express what lies too deep in life for expression. In Japan the lotus flower is seen on every temple altar. Made of gold or silver paper, it is carried in every funeral procession, a symbol of the immortality of the soul.

Botany pupils are learning to know flowers in their own haunts without uprooting them for herbariums. Many flowers that grow in abundance are not at all injured by moderate picking, but too often we pull up the whole clump and do not stop so long as there is a flower in sight. The hepatica, diцентра, spring beauty, and bloodroot growing in moist woodlands and hillsides are easily uprooted. They are among our vanishing flowers and should not be disturbed. The same is true of the American columbine. It has to scatter many seed to insure propagation. The jack-in-the-pulpit is a northern representative of a large family of tropical plants. Two years ago a class of school children, under the guidance of teachers uprooted 410 jack-in-the-pulpits in New York botanical gardens in a small area. They were taken and replanted. It is necessary that our teachers be warned and trained against unnecessary destruction. Ruthless picking of almost any species will in the end prove disastrous.

The attention of the public is slowly being drawn to this wanton destruction of wild life; it must be followed by education. Some of our western states are encouraging children to raise wild flowers in home and school gardens, to gather the seed and sow it again in woodland, marsh or meadow, to increase declining species.

It is time we were getting a vision of what this country will be robbed of—its natural resources, plant and animal life. It is not enough that we cease our wanton destruction, we need to replenish the earth. May Iowa become a sanctuary where her wild plant life is secure.—Iowa Forestry and Conservation Association, Report 1914-15, pp. 75-9.

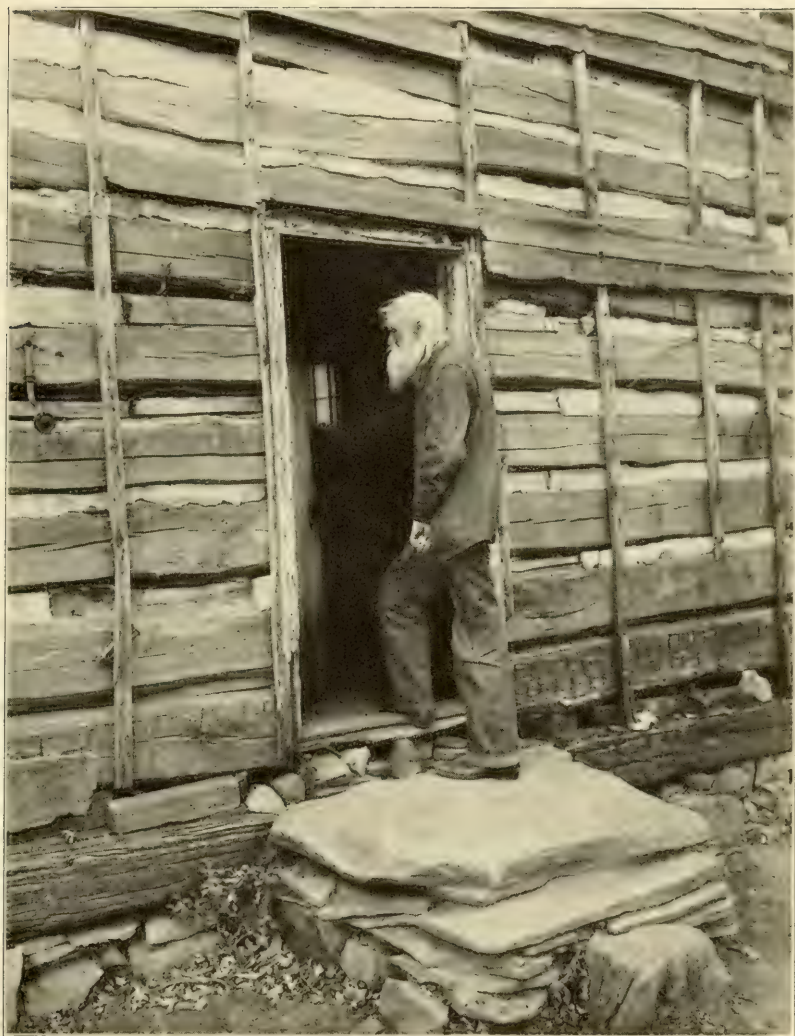
RELATION OF THE COMMUNITY TO THE PRESERVATION OF WILD PLANTS.

By Henry S. Conard.

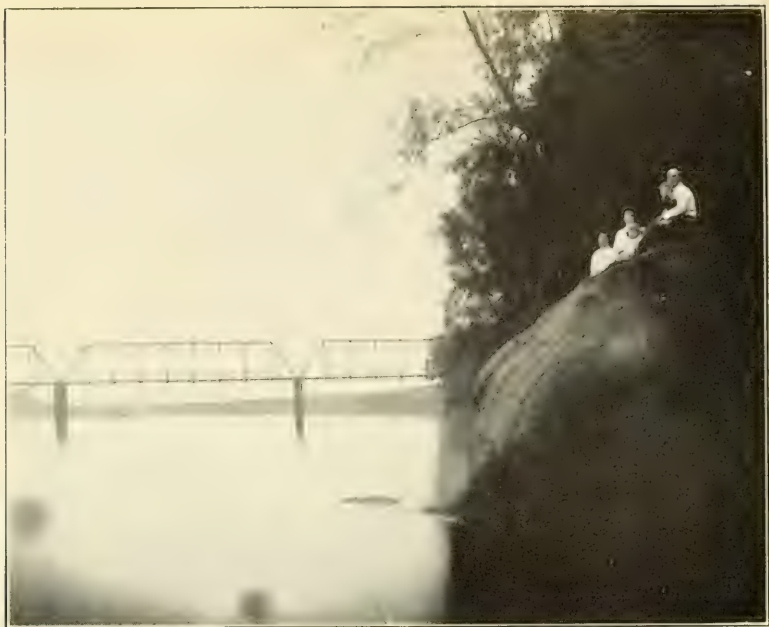
Those of us who live in temperate climes have a natural heritage we would do well to appreciate. That heritage is the world of wild flowers that brighten the vivid green backgrounds of our woods, thickets, and fields. We are too apt to think that the greatest beauty of the plant world has been lavished upon the unhealthy tropics. It is true that many of the most gorgeous flowers of our gardens and greenhouses are of tropical or subtropical origin—the begonias, cannas, geraniums, and the most exquisite orchids. Travelers go into raptures over the tropical vegetation. But notice that it is the vegetation that they speak of, not the flowers. They do not tell of the endless fields of verdant grain and grass, flecked with cloud shadows, and billowy with a passing breeze. Nor do they tell of miles of brilliant colored flowers lining the highways and river bottoms. This is the luxuriance that they dwell upon—the huge leaves, the masses of foliage, the dense jungle of trees and shrubs and vines. Is not the botanist who goes to Florida or Southern California bitterly disappointed to find that south of Virginia there is no grass, and that the hills round about Los Angeles are beset with bayonet-like yuccas and spiny cacti?

No, the tropical forest, like the dark coniferous timber of our mild northwest, is too dense to permit of any great amount of bloom. Many of the trees and vines of the tropics have showy flowers, and bear them in great profusion—the poincianas, the allamandas, etc.—but conditions are so stimulating to plant life that a host of species of trees, shrubs, vines, and herbs are crowding each other for room. These forests frequently contain over fifty species of trees. The novice in such a wood has difficulty in finding two trees of the same kind; they seem to be all different. This is the usual condition in the tropics. It is thus quite impossible to find any great continuity of color, other than the dark and shiny green of thick and leathery leaves, whose polished surfaces reflect the sun like bits of metal.

No, my friends, the glory of an earth covered with unbroken verdure, and adorned with acres and miles of brilliant flowers is given only for



Ruckman's Cabin, Marion County.



Projecting Stone Near Monkey Mountain, Wapello County.



Loess Topography, Monona County.



Wild Rice and Arrowhead.



Paradise Valley, Bixby Park.



Marginal Fern, Steamboat Rock.



Loess Topography, Monona County.



Balsam Fir, Allamakee County.



Silver Lake, Palo Alto County, Dam and Outlet.



Shooting Star.



Entrance to Moorehead Caves, Maquoketa.



Ostrich Fern.



White Pines and Paper Birch, Allamakee County.



Group of Wild Plants.

the delectation of the dwellers in the temperate zones. It was in temperate England that Wordsworth saw his host of dancing daffodils, and Burns his daisy. And that portion of Japan where landscape art has its apotheosis is warm temperate, not subtropical.

Our whole Atlantic seashore is gilded in autumn with the massive heads of the evergreen goldenrod (*Solidago sempervirens*) right out to the upper reaches of the waves in storm. The salt marshes are decked all summer with pink and white hibiscuses and starry sabbatias. The meadows of eastern Pennsylvania, New York, and New England are brilliant with dandelions in May, while the barren hillsides are carpeted with acres of mountain pink. Then comes the golden covering of buttercups, then the gold and silver daisies, and in summer the lace-like flea-banes and wild carrots. And when autumn spreads her loom over the landscape, her tapestry marks out the rivers with miles of yellow cereopsis, the old fields with a wealth of goldenrods and asters, joe-pye weed, and sumach berries, and the creeks and hills crimson and gold maples and hickories, oaks and tulip trees.

Not less wonderful, but more so, is the course of Flora's seasonal display in Iowa. Very coy that goddess is with us in spring. She blushes faintly with the soft maples, and then retreats while brusque Jack-frost puts on another scene or two. But suddenly in May she doffs her modesty, and shows herself in all her graceful curves and living color.

Nowhere, I ween, is greater floral beauty displayed than on the hills and prairies of Iowa, unless it be perhaps in the short growing season of the alpine meadow, where spring and summer and autumn are crowded into a period of six or eight weeks. Have you stood on an eminence overlooking a river valley in mid-May, when the oak leaves are as big as squirrel ears? There is color and texture and mass and extent that demand the pen of a Ruskin or the brush of a Turner. Below you on the river bottom are whole acres of dog-tooth violets, spring beauties and bluebells. Back on the slopes the wild crab is dotting or covering the banks with its glow of pink, and exhaling its most exquisite odors on the breeze, and offering food and home to every busy bee or loafing drone. Does anyone believe that the cherry trees of Japan are more lovely? Impossible. I have seen a solitary tree of *Pyrus coronarius* on a Pennsylvania hillside, and a glorious thing it is, both to sight and scent. But *Pyrus ioensis* is its equal, and the meanest draw may be adorned with dozens of them. Then while the first pink petals are fluttering from the failing crab blossoms, the wild hawthorns spread great sheets and balls of snowy bloom, while all beneath, the lavender phlox displays its numberless tufts of airy blossoms.

The traveler on the railroad sees no more dazzling sight along the right-of-way than the miles of gaillardia, oenothera, and callirhoe in eastern Kansas, the grindelias and sunflowers of Nebraska, the gorgeous spiderworts, pink, blue or white, the big anemones, and the pink phloxes of Iowa. And then in late summer we have that wonderful burst of gold along the railways and roadsides and rivers which once made these vast prairies a marvel of brightness. Our coreopsis, helianthus species, heleniums, rudbeckias, lepacchys, heliopsis and liatris, our massive golden rods and misty asters are typical of the lavish health and vigor, freedom,

purity and joy of Iowa life at its best. Has the Iowa community great or small, any interest in all this? And should it have any?

Have we any interest? Well, yes, a little. We all like to gather arm-loads of flowers. The children delight in them. And in my home town of Grinnell there is a pretty custom of keeping a big pail or crock of autumn flowers on the front porch, enjoyed alike by housemates and by passers-by. The autumn flowers keep well and are admirably adapted for this purpose. But "trade's unfeeling train usurp the land and dispossess" the wild flowers. There is not within twenty miles of Grinnell an inch of ground uncultivated or untouched by men or stock. The result is that the native prairie flora has almost disappeared. Once the ground is cropped, the old wild plants never get hold again. Even the railroad banks are mowed and burned during the summer, and the roadsides are mostly trimmed. Two small parcels of ground a mile from town, too dry and rough for cultivation, have a fair showing of native plants, but these are usually mowed in August. Weeds and waste places we still have, it is true, but they are all like ourselves, immigrants from Europe. Not one of our splendid native plants even offers to become a weed. They give up the struggle at once. Indeed so reduced is the native vegetation hereabouts, that Grinnell College was compelled perforce to establish a small botanic garden, where at least a specimen plant of the native species can be had for study and acquaintance. We hope and long for the day when our facilities in this line can be really adequate.

Now many of our citizens would admit that the obliteration of the native flora is regrettable. And many enjoy and admire our little botanic garden. But no individual could be expected to set aside a portion of his farm as a public wild flower garden. The wild garden and park can never be, except as a community project. But so far as I am aware, no one has ever thought out loud proposing such a public property. Of course, the college has often thought of it, and desired it. And meanwhile, the wild plants are practically gone. If there exists any community interest, it is merely a spark which might, however, be fanned into an effectual flame.

But should we really have a community interest in this matter? In considering such a question, it must first be remembered that whatsoever benefits the individuals of the community is a community interest. Many individual affairs of quite personal nature are fostered by community action and interest. A community may by concerted action make or unmake a local creamery or canning factory or grain elevator company. And yet, these activities are apparently plain business propositions, for the profit of the owners or stockholders. But because they benefit the community and are dependent on the good will and co-operation of the community, the community takes concerted action to maintain them. Now if this community interest is necessary to maintain businesses which are in themselves financially profitable, much more must the community maintain those interests which it needs but which do not bring in a return in money. Generally speaking, then, interests may be monetary or non-paying. In the latter class are the public service necessities, such as water supply, sewage system, and garbage disposal, the means of public

education in science and art, such as schools, libraries, museums, and provision for public recreation, such as halls for meetings, lectures, music, parks and playgrounds.

The native vegetation of Iowa, or of any other region, is alone fitted for the fulfilling of several of these public needs. We have purposely dwelt at length on the beauty of our native flora. Trees and wild flowers furnish educational material of inestimable value. Their aesthetic significance cannot be measured. It is an indispensable element of human culture. For recreation, every wood, where picnics and like gatherings can be held, is where individuals or families may get out into God's out-of-doors. This need is acknowledged in big cities. It is just as real in every small Iowa town. But in no such town is it provided. A recent bequest from a large minded citizen gives Grinnell a prospect of a park which will meet the purposes of playground. But we, like all other communities of similar size or smaller, still need the larger tract, where people can really get back to nature, and cook a meal over a campfire, and gather flowers to their hearts content. These aesthetic and recreational necessities are real, they are communal, and can only be provided by community effort. This is the point which I most desire to make.

I confess to very little interest in calculations of the increased value of real estate resulting from public improvements, I am still less interested in the boom to the general business of the community. But both factors are very real. Property values and general business are wholly dependent upon the presence of people—people with taste, and with high desires. There is no doubt whatever that those communities which provide themselves with modern conveniences are preferred by all kinds of people when choosing a home. The more a community has of the higher values of life, the better it is liked, the more it is sought out. And this means business, even though I would shrink from suggesting that art galleries and symphony orchestras, or parks and playgrounds really pay.

But beside this, I am more and more impressed with the possible importance of our native flora as commercial material for nurserymen, horticulturists, and florists. The Iowa crabapple, wonderfully beautiful in its wild state, has already given us the Bechtel crab, whose double rose-like flowers defy description. Is there its equal on the face of the earth? We have also the Souldard crab, a derivative of *Pyrus ioensis*. Just last fall there came into notice near Grinnell another crab of the *ioensis* type, but much superior to the wild form, and worthy of a place in gardens and orchards for its large, yellow, and meaty fruits. Evidently our wild crab should be carefully preserved and studied, and its possibilities developed.

The native wild plum seems to have already reached its limit of perfection. But one should never cease to look for still greater improvement in the future. May not the wild gooseberries, the haws, the shad bushes, the grapes yet prove valuable sources of hardy and productive fruits?

The observations of the past few years have satisfied me that in many of our wild flowers we have material for improvement and development well worth our care. *Phlox divaricata* has already yielded an important variety, and a series of very promising hybrids. Why might not it, or the even commoner *Phlox pilosa* become as useful to man as the better known *paniculata* phloxes or *P. drummondii*?

In the Grinnell College botanical garden we have tried all the species we could get of asters and goldenrods, rosin weeds, sunflowers, rudbeckias, and the like. I have also sent specimens east for experimentation. Generally speaking, the prairie flowers are not a success in the east, owing to excess of moisture and deficiency of light. They grow tall and spindling and easily fall over. But that simply means that we need to develop dwarf stock types suitable for that climate.

Some of our plants are already quite ideal for cultivation. *Heliopsis* is a most satisfactory garden plant, and is today quite equal to the *calendula* which has been cultivated and selected for hundreds of years. *Rudbeckia subtomentosa* is one of the most splendid objects in our gardens. It grows most vigorously, has no enemies, makes a very shapely tussock of stalks, is easily propagated but does not spread about. Only a very severe drought dulls its beauty. A single spray of this plant in full bloom is a very showy object. It ought to be widely cultivated. *Lepachys pinnata* behaves most admirably in cultivation. It forms a neat compact clump of roots, from which spring a large number of slender stalks, each bearing several of its airy negligee heads. There is nothing among the yellow flowers more neat and airy and altogether wild and modest in appearance. This plant already appears in many slight variations. It is just waiting for the hand of the plant-breeder. *Helianthus grosseserratus* is another plant which exists in several slightly different forms, waiting for careful training and selection.

Our native *helenium* is second to none of its relatives, either in natural beauty, luxuriance of bloom, size, color, habit of growth, or ease of propagation. Two eastern species are in gardens—why not ours too?

And so, one might go on to discuss a host of native plants that will some day be valued at home, and will doubtless be recognized as great treasures by flower lovers everywhere. It would be a real calamity for these species to be obliterated, or reduced to insignificance.

By way of preserving the native flora and beautifying the countryside, it has been suggested that more discrimination be used in the trimming and cleaning up of our roadsides. Let alone the gorgeous beds of native flowers, and even the occasional tufts of wild plum and crab apple. Cut off only the foreign and unsightly weeds. This plan is admirable if practicable. But I see very little hope of carrying it out until every farm laborer is both artist and botanist, or until all our roadsides are cared for by landscape architects.

Much might be done by private effort. Use the native flora in your garden. I find it splendid. On large estates in Iowa, if we are to have such, let the landscaping include a proper share of natural vegetation. Why import from the ends of the earth, and copy the decorations of other regions? Let us have a prairie art, our own in style and in material. Then allow the public to come in and enjoy your great estate. If privately developed estates, must be closed to all the poorer flower-loving neighbors, as they usually are in the East, then may Iowa be spared such selfishness. Rather let every schoolhouse become a social center. There let art, literature, and music flourish indoors, and let landscape art befitting the place flourish outside. Couldn't we afford an acre of land

around each school, devoted to trees, shrubbery, and wild flowers? These to be our estates and places of ease and culture and beauty.

And so, in the end, I can see nothing for it but community enterprise and public ownership. We must work for state and national wild flower preserves, and for town and district parks and outing grounds, just as we advocate public schools, libraries, and churches, and for the same reasons—Iowa Conservation, Vol. I, No. 1, pp. 8-10.

IOWA'S NATIVE PLANT LIFE.

By Mrs. E. A. Burgess.

The preservation of wild flowers and plants may seem unimportant to those in whom an interest in nature has not been awakened, or whose interest is limited to nature merely as the provider of practical human wants. The same observation was true at first of the birds and trees, but the public has now become thoroughly aroused to the necessity of their preservation, if upon economic grounds only. The prospect of the extermination of many of our choicest flowers and plants is not apprehended by the public generally, but every observer and lover of wild plant life foresees this result unless individual and collective efforts shall be earnestly directed toward their conservation.

To preserve trees as one of the great natural resources of the country, as well as for their great aesthetic value, national, state, and private forestry organizations have been formed which have already developed an active public opinion on this subject, and which have been instrumental in securing the enactment of laws with respect to the cutting, destroying, and planting of forest trees, and making it a misdemeanor, punishable by fine or imprisonment, or both, to destroy trees under certain conditions. Likewise, Audubon societies, organized for the protection of song and game birds, have created a strong public sentiment against the wanton killing of birds for their plumage or for sport. Much instructive literature has been distributed by the national government covering bird and forest preservation. According to a bulletin issued in the fall of 1912, ninety-five national reservations for the protection of wild life had been established by executive order during the preceding twelve years. There are, also, a number of national tree preserves. But I do not find any data indicating that the national government is doing any work or carrying on any campaign against the extermination of the small plant life of the country. I know of no government bulletin bearing directly on this subject. That the general public is still indifferent to the subject and does not realize its importance, is indicated by the dearth of literature bearing on the question.

Are the familiar wild flowers and plants vanishing in any appreciable degree, or is the prospect of their greater scarcity or extinction so imminent as to give occasion for alarm? An Iowa authority, Mr. Frank C. Pellett, of Atlantic, gives it as his opinion that in twenty-five years many of the "beautiful blooming things of nature" will become extinct unless

something is done to preserve them; that the limited areas left for flower growth and propagation, together with the increasing demand for blossoms, will in a short time result in their destruction unless the public becomes actively interested in their protection. That the necessity for action in this regard exists is evidenced by the recent formation of a national association called the "Wild Flower Preservation Society of America," with headquarters at the New York Botanical Garden. Of the nine pamphlets published by this society calling attention to as many flowers that need special protection, six are native to Iowa, jack-in-the-pulpit, bird's foot violet, pink moccasin flower, wild columbine, wild pink, and spring beauty. From an article written in 1913 by Mr. Pellett, I noticed that a society for the preservation of wild flowers was being organized in Iowa. I addressed a letter of inquiry to this society, but received no acknowledgment, and, therefore, cannot furnish any information as to the form of the organization, its progress or methods. The framework of this organization might possibly be utilized for work throughout the state, as suggested later on in this paper.

There is probably no wild flower in Iowa that is in immediate danger of complete extermination, but many flowers have quite disappeared from roadside places, and from the range of drives or tramps out of our cities and towns. This wanton destruction is not limited to the country, but extends to public and private parks. The reasonable picking of wild flowers in sparsely settled communities is not noticeably detrimental, but every part of Iowa is now well settled. The great mischief is that no discrimination is applied respecting the habits of the plant, and no consideration is given to its preservation or the rights and enjoyment of future generations. To such as are unable to go where some of the most beautiful flowers grow, several blossoms will afford as much satisfaction as an armful. Most of the flowers that are in danger of extinction are unsuitable for house decoration, because they are so delicate that they fade too quickly. The coarser flowers, such as the daisy, black-eyed susan, meadow rue, Queen Anne's lace, aster, and goldenrod, all seem so able to shift for themselves that reasonable picking would not greatly endanger their existence, and they are much better adapted to decoration than the delicate varieties. When we recall that picking and distributing bouquets of wild daisies, at the suggestion of Jacob Riis, resulted in organizing the New York settlement work, we can readily appreciate how good may result from the intelligent use of wild flowers through their subtle appeal to the finer human sensibilities. It is the spirit of vandalism in the American people that is blameable, and that must be controlled. We frequently see people returning from the wood or meadows with arms and baskets full of dutchman's breeches, columbines, violets, bearded tongue, and ferns, only to throw them away when reaching home. Such marauders are not content until they have picked everything in sight. Every spring the hills about our cities are dotted with children picking all the pasque flowers they can carry, and for the love of picking them only. Every normal person loves flowers, but only a comparatively few truly and scientifically appreciate them. Much can be done to help the people to more fully understand and appreciate the habits, beauty, and influence of flowers by discouraging the careless and unthinking picking of them.

Children would not damage and kill the wild flower plants if they were properly impressed by those having them in charge, that carelessly pulling a flower dislodges or exposes the root, and often destroys the whole plant; that there is danger that the bloodroot, dutchman's breeches, ferns, water lilies, and many others of our beautiful native plants will become extinct from such conduct; that the butterfly weed, which blooms so brilliantly in August, is in peril from the fact that, unlike other members of the milkweed family, it is much pleasanter to pick than the more juicy kinds; and that the loss of a single flower often prevents the sowing of hundreds of others, as in the case of the columbine which is so easily destroyed by heedless picking, because it is one of the variety of plants which must distribute many seeds to insure continuing propagation. If such facts were brought to the attention of the children and grown-ups, they would soon learn to consider the flowers and would enjoy them more by the exercise of a little intelligent denial than by all the careless picking and slaughter without any object in view, and a sense of love, tenderness, and responsibility for their protection would be developed. The appeal must be made to save the beautiful plant life that providence has placed about us to brighten and give variety and inspiration to human existence; to inculcate a feeling of reverence for the beautiful things in nature because of the pleasure they give and their reflex influence on the finer human sensibilities; and the desolation of life if we had to do without the presence and lovely fellowship of plant life.

"If I do not pick the flowers some one else will," is a common expression. That, in a measure, is probably true. But by refraining yourself, and striving to teach others likewise, you will at least have done your part toward giving the plant a chance to live and produce seed, and do its work in the world. The failure then will not be yours.

As the destructive spirit involved in careless picking is the prevailing cause for the increasing scarcity of many plants, the manifest need for the preservation of wild plant life, as in other lines of similar work, is education—the development of favorable public opinion. Children are especially susceptible to such instruction, and they might be reached through the public schools. Arbor day has had a wide and wholesome influence in awakening the American people to the necessity of conserving our forests.

The observance of Arbor day affords an excellent opportunity to arouse in children a desire to know more about the trees, flowers and animals—to take care of them and to care more about them. The spirit and work of Arbor day should not be limited to a single day annually; it should be carried through the year. To continue the interest and instruction every school should have its garden. Even if the school ground is so small that most of it be used for playground purposes, still a corner may be found somewhere for a wild flower bed. The boundaries may be outlined by hedges made of native shrubs. The care and growth of the flowers will furnish many an interesting and inspiring lesson. The country school grounds, of course, present greater opportunities, and unlimited possibilities along this line will be afforded by the coming community rural school, if only proper provision is made for the work in laying out the school grounds. By thus fostering the love of nature and natural beauty,

an interest will be awakened in general civic improvement, and the whole country and city landscape will be beautified by the movement. The beauty of the homes, school grounds, roadsides, and public places of the future rests with the children of today and tomorrow. They, as children, should be made an ally of the community in all public betterment. It is not necessary in planting and preserving wild flowers and shrubs to rob either nature or the public, as nearly every kind of wild flower one would care to grow is already cultivated. In many instances nurserymen can furnish plants cheaper than they can be collected in their wild state, and in most cases they can supply varieties that have been exterminated in any given locality, or that never grew there. But the important thing is that the nurserymen propagate the plants. Too much enthusiasm in the study of nature work sometimes results in the extermination of entire plant colonies, as was the case with some New York teachers and children who were found to have uprooted four hundred and ten jack-in-the-pulpits in a small area in the New York Botanical Garden for the purpose of study. So great was the destruction in New York state that certain wild flowers were eliminated from the list of botanical supplies in the New York public schools, among them trailing arbutus, wild columbine, fringed gentian, hepatica, Indian turnip, meccasin flower, wake robin, and wild orchid, and cultivated plants were substituted for wild ferns, Solomon's seal, wild geranium, and others.

Instead of bringing the plants and blossoms into the school room for demonstration, excursions might be made to the fields and woods one school day in each seasonable month for the purpose of studying the plants in their wild state. In this way the children would develop an interest in plant life, and would learn to really know and love wild flowers, which is possible to those only who know the flowers in their natural surroundings, and at the same time the outing would be invigorating to both teachers and pupils. It is self-evident that the nature of every animal, the habits and beauty of every bird, butterfly, and flower can be seen and studied to the best advantage under natural conditions. Those who make a practice of studying plants where they grow, acquire that profound knowledge and insight which distinguish the scientist from the amateur. Such study tramps should, of course, be conducted by persons competent to instruct the children as to the structure and nature of plants, and the essential principles of their conservation.

Interest might be aroused in school children through competition by a series of essays bearing on the various phases of the subject of plant life, for which recognition in the form of honors or prizes should be given. The public may be interested and aroused to a conception of the importance of preserving and restoring natural beauty by lectures illustrated with plain or colored lantern slides, by publicity and the distribution of literature, by articles in newspapers and magazines, through the activity of women's clubs, mothers' meetings, boards of education, church decoration committees, village improvement societies, and such other local bodies as are in any way interested in the betterment of local conditions. Moderate funds, would of course, be necessary to carry on the work of providing and distributing literature, the raising of which would have to

be worked out by each community in its own way, in the absence of any power to levy taxes for such purposes.

In some states there are laws for the protection of certain plants where the danger of extermination has awakened the public to a realization of the situation. Something has already been done to preserve and protect plant life in public parks and preserves by some of the states. The proper authorities in Iowa have power to adopt and enforce regulations forbidding the destruction of plant life in public places. But legal restrictions of themselves are only feebly educational, and do not effectively furnish the desired protection.

Too often legal prohibitions seem only to serve to call attention to the fact that certain plants are rare or beautiful to crude or mischievous persons who delight to break such laws. Posters have been used forbidding under the penalties of the law the gathering of wild flowers and ferns, the destruction of any tree or shrub, or the setting of fires in public parks and reservations, but the shocking devastation of the woods and parks continues, nevertheless. How, then, may we preserve and protect the natural beauties of the field and woodland? Manifestly only by the gradual process of education. The appeal for the preservation of the wild flowers cannot be made on the basis of their economic value, though they do furnish considerable food for the honey bee and the birds, as well as shelter for native birds and animals, and their mold helps to enrich the soil. The plea must be addressed to the aesthetic sense, to love of the beautiful in nature for its own sake, and to the charm of the beautiful in nature as a joy-giving and refining influence.

Every civic center, every state institution, university, and college, should maintain at least one natural park, including wild woodland, and, if possible, a river, or water in some form. It should have walks and drives, but no set planting whatever. The planting, if necessary at all, should be of the native species of wild plants and shrubs, planted naturally and then permitted to multiply in nature's own way. The blue grass should be kept out of the wooded tracts to preserve the more delicate and refined native plants, as blue grass, so valuable to the farmer, will drive the native plants out of the woods.

There should be more private preserves in Iowa. I had never heard of a wild flower preserve in Iowa until I read in a newspaper this fall of Mr. Pellett's preserve at Atlantic. Mr. Pellett, according to this newspaper article, advocates a preserve for every county, or if possible for every township. The magazines and papers often mention private or club bird reservations. But as plants and birds go together it is unquestionably true that these bird preserves protect the flowers as well.

There is a way in which all of us may help to arouse latent love for the beautiful in nature, and that is by organizing and joining roadside gardening clubs. Such a club would be open to all, would cost nothing but personal interest, would not require state or county aid, and would add much to the pleasure and enjoyment of the community. The sole object would be to beautify the drives around your respective towns and cities by sowing wild flowers and planting native shrubs and trees along the public highways. Care should be taken not to sow the seeds of plants that are likely to become noxious weeds. Rather plant the best of the

native flora. Judgment should be exercised in providing the plants with those natural conditions which are essential to their growth. Much could be done in this way in a very limited time. We all realize the value to the future of the careful planting of a single tree, but too few of us realize the importance of saving our native shrubs and plants. If more could be done in the way of pointing out the beauty of our native plants, and the necessity of preserving them for their own sake and the sake of posterity, those who now so thoughtlessly destroy them would conserve them, would gather and sow seeds, transplant vines to cover and beautify fences, fill the ugly corners with blossoming beauty, and move to the roadsides the trees, bushes, and plants that are in the way in the fields. Why may not Iowa have more of the fine old roadsides one sees in New England, with their arching elms and endless succession of shrubs and occasional colonies of hardy wayside flowers? It is only natural that with the development of the country, the prairies which once contained so many beautiful phlox, larkspurs, buttercups, honeysuckles and a multitude of other varieties, should be cultivated, but all the highways can be converted into things of beauty by planting native flora and preserving those that are already there from destruction by township officers, who seem to prefer a bare road and mown grass to beautiful natural conditions.

With the progress of intensive farming comes the plea for narrowing the highways from sixty feet down to forty feet or less, so that the products of the farm may be increased. If this change should be made much of the possibilities of beautifying the roadsides would be lost. If the Illinois Central railroad, to save the expense of keeping "weeds" off its right-of-way, carries out its announcement of cultivating its right-of-way between Sioux City and Chicago, for the benefit of the adjoining farmers, and the other roads do likewise, then one of the chief agencies for the distribution and propagation of plant life will be cut off. Why not rather treat railroad rights-of-way in a manner similar to that suggested for the treatment of public highways, and thereby convert such unattractive rights-of-way in avenues of beauty that would afford pleasure equally to the localities traversed and the traveling public? Forage and the grains are, of course, of the highest importance to Iowa, but do not the rare and the beautiful things which have a place in the profound economy of nature also have a right to existence, and is not their existence essential to the highest human happiness and the finest type of civilization? Let us, therefore, put forth such organized and individual effort as may be necessary for the protection of our native plants, and the education of the people to a realization of their nature and beauty. Let us change public indifference into such interest as will concede the native plants of Iowa a place in the economy of the state. If the subject receives the encouragement and support of all those who in the best sense love the trees, shrubs, plants and flowers, they will in good season be amply rewarded for their efforts by the success of the enterprise and the gratitude and appreciation of all the people.—Iowa Forestry and Conservation Association, Report 1914-15, pp 89-99.

THE DISAPPEARANCE OF NATIVE PLANTS IN IOWA.

By J. A. Spurrell.

I think all will admit that it is desirable to preserve our native plants, because some of them are indispensable in medicines and must be cultivated if they become rare; some deserve preservation because of their beauty; some because of possible economic utility; all deserve it because they show present day Iowans small portions of the glories of the unmolested forest, the unbroken prairie, and the undrained marsh of a former Iowa.

To preserve our native plants two things are necessary, a place to grow and protection of flower and seed. The sentiment: "It is better to admire the beauty of our native flowers, where they grow, than it is to pluck them to wither in a vase," should become universal in Iowa.

Unfortunately, many of our rare flowers will be extinct long before our people can be educated to this ideal, if such an ideal state can ever come, therefore, other means must be adopted.

From a preservation point of view, our native plants may be divided into three classes, with differing needs of protection according to habitat, the forest plants, the prairie plants and the plants that grow in the water in swamps.

There is no woodland near my home, so I know little of the needs of these plants, but if forest reserves were created in Iowa by state action, as they should be, our trees and shade loving plants could be amply taken care of.

Almost the only places left where prairie plants grow are the roadsides and railroad rights-of-way. The greater the distance from towns the more abundant are the common prairie wild flowers, and the more numerous are the rare species, showing that urban people need more education on wild flower preservation than the farmers who would miss the roadside flowers were they gone, although rightly regarding many of them as weeds in their fields. The roadsides are owned by so many people that little practical preservation is possible on them. However, they furnish splendid places for our native grasses and legumes to grow. If not destroyed by plowing, too close grazing, or so frequent mowing that they cannot mature seed, these plants will hold their own against all invaders, and will come in again as soon as the land is left undisturbed. I have seen big and little bluestems (*Andropogon provincialis* and *scoparius*), side oats grama (*Bouteloua racemosa*), slough grass (*Spartina cynosuroides*), and other grasses do this. Big bluestem grows on our town school ground, which is deserted during the summer. Vetch (*Vicia americana*), vetchling (*Lathyrus venosus*), ground plum (*Astragalus caryocarpus*) and other native legumes also grow well where undisturbed. Some of the fertility of Iowa soil is due to the former abundance of these plants.

On the railroad right-of-way our native plants have only the annual mowing and unlimited flower plucking to contend with. They could be preserved here by co-operation between the railroads and a permanent Iowa Conservation Commission or Board, not now in existence, but much

needed. Whenever possible, the annual mowing should come when it will interfere least with the flowering and fruiting of our native plants. Biennial mowing, when possible, would benefit many species, especially the grasses.

Rare and beautiful species should be protected by wardens at flowering time. In my locality these would include the pomme de prairie (*Psoralea esculenta*), the anemone (*Anemone patens*) and the downy gentian (*Gentiana puberula*), of the dry prairies, and the closed gentian (*Gentiana andrewsii*), the small white lady slipper (*Cypripedium candidum*), the Turk's cap and orange red lilies (*Lilium superbum* and *philadelphicum*), of the moist prairies.

I would be opposed to any artificial parking, to effect an "improvement" of the landscape along the right-of-way. There is more absolute hideousness visible from the railroad tracks in the towns and cities of our state than there is in all the open country. Let the railroad parking be confined to the towns and cities where it is most needed and appreciated and the most people receive benefit from it.

The plants growing in the water or in marshes are harder to preserve than any others, since so many of the lakes and swamps are being drained and the general water level is lowering year by year. In my locality the sweet-scented water lily (*Nymphaea tuberosa*), bladder-wort (*Utricularia vulgaris americana*), the iris or blue flag (*Iris versicolor*), the water arum (*Calla palustris*), the pickerel weed or water hyacinth (*Pontederia cordata*), and the white fringed orchis (*Habenaria blephariglottis*), are in special danger of extinction.

Quill reed or reed canary grass (*Phalaris arundinacea*), cat-tails (*Typha latifolia*), great burr reed (*Sparganium eurycarpum*), arrow head (*Aquatica*).

I see no way to reserve water and marsh plants, except to set apart special reservations, similar to the federal bird reservations. As an illustration of the need of this, on Wall lake in Sac county an area of about 70 acres was formerly covered with water lilies. In 1913 an area of 8 square rods would include all the lilies remaining, and there was only one bud and no flowers on the patch early in August. In the meantime, people had gathered lilies by the boat-load and wash-tub-full, cattle had devoured them and drouth had fluctuated the lake level. These lilies need total protection for several years, then a number limit on the persons who gather them. Reservations for marsh plants should be so located that they will not be destroyed by the drainage of surrounding land.

Do we not need a law in Iowa providing that the state will accept and care for gifts of land for forest, plant and bird reservations, when the land offered is found by competent authority to be suitable for such purposes?

We surely need a law providing for a permanent Conservation Commission, the appointment which should be as far removed from politics as possible. All the natural resources of the state, not under the jurisdiction of the fish and game warden, the forests, wild plants, lakes and streams, noted or curious natural formations, etc., should be under the

jurisdiction of such Conservation Commission, since these things belong to all the people and are cared for by none, for "everybody's business is nobody's business." All state parks and reservations, which may be created in the future, should also be under the commission's jurisdiction.

The law creating the commission should give it authority to issue, for the conservation of our natural resources, regulations having the force of law, varying in different localities to suit different conditions. Our national parks and forests are governed in this manner, so it should be practical in Iowa.

Unless such measures are taken, 10 years more will see the rare flowers of my locality extinct; and 25 years, most of the remainder gone. The need is great and it is time for prompt action, especially in regard to marsh plants.—Iowa Forestry and Conservation Association, Report 1914-15, pp 100-104.

PRESERVATION OF NATIVE PLANTS.

By Harriett S. Kellog, Botanist.

A natural woodland carpeted with a mosaic of wild flowers appeals to each individual according to his inherent traits of character. One estimates it in terms of cord-wood and acres; another banishes all utilitarian ideas, seeing it only as a most glorious heritage to be preserved that future generations may also enjoy its beauty, while the third imagines a golden mean wherein both the utilitarian and the man of sentiment may be satisfied.

With the prevailing high prices of land in Iowa, it is not practical that ground valuable for agricultural purposes should lie untilled, but there are many places in the state that have been denuded of their forests, when the forest was their most profitable asset. The writer has in mind a locality that thirty years ago contained a wonderful growth of black walnut; back of this were hills covered with native timber. Fifteen years ago, a ride over this locality disclosed the fact that the walnut land had been cleared. This was then good farm land, the change having been made for the better, but the hills were bare also, the streams that had carried moisture to neighboring farms had disappeared, violent storms had eroded the slopes, which never could make good farm land, and in place of the beauty of stately oaks, elms, maples and hickories with the undergrowth of herbs and shrubs, was the sun-dried soil, where a few cattle secured scanty sustenance.

On one of these hills had been a grove of wild crabapple that was visible for several miles and in the spring offered a vision of beauty not to be forgotten.

There had been an abundant native flora that has all but disappeared from its natural home. A few lovers of wild flowers had, with infinite pains, now and then transplanted these woodland species to their town gardens and thus many varieties have been preserved in the near vicinity that would otherwise have been lost to the flora of the state.

When the tide of immigration set into Iowa during the middle of the last century, the pioneers found a flora paradise here. The hills were

blue with violets; phlox made the meadows brilliant; lady slippers grew in the deep woods; cardinal flowers gave color to the late summer landscape; and water lilies flourished in the streams and lakes. Today, the lady slipper, cardinal flower, and water lilies are extremely rare in central Iowa and yet students at Ames during the 70's recall collecting the two former on the college land lying near the Northwestern railroad tracks. A later example of complete extinction has come within the writer's experience. Eight years ago at Ames along College creek, were plantations of the beautiful orchid, *Spiranthes cernua*, and the stately Turk's cap lily, *Lilium superbum*. The march of improvement has swept away both of these; first the orchid, which disappeared when the new road was opened, later the lily, which fell before the ruthless sweep of the scythe and lawn mower. Here and there are patches carefully preserved, that are the delight of the botanist and nature lover. As one example, we might mention the Hayden farm near Ames, where many species, as the cardinal flower and the beautiful pasque flower, otherwise unknown in this vicinity of Iowa, are carefully protected.

It is not that we do not admire the delicate native flowers, that we take so little pains to save them; it is rather that in our haste to accomplish more important things, we have been unconscious of the prevailing trend, until now that we are threatened with the complete extinction of many of our most beautiful varieties, we are wakening to the fact that immediate action is necessary if we would stay the destructive movement. Granted that it is not practicable always to retain our wild plants in their natural habitats, there is offered the alternative of transplanting and protecting them in new homes. In this step we, however, are confronted with many hindrances. To many of our home gardeners, the difficulty of obtaining these native plants places them almost beyond possibility of possession. Seeds of alien plants may be purchased from the local seedman during an ordinary shopping expedition, or be ordered by mail without stirring from the house; greenhouse plants may be easily obtained, but the dainty spring beauty and the graceful blue bell hide in the forest and are not easily accessible to one who would have them in her home garden. Their blooming period is short and having accomplished this, they soon disappear and are not seen again until a new spring awakens them. Hence, one must be alert who would find them in time to recognize and transplant them. These two plants easily adapt themselves to a new environment and after becoming once established bloom and increase year after year as if in their natural habitat.

It would be difficult to find a more beautiful vine than the perennial moonseed. Its thick, ivy-like leaves quickly cover a trellis; it is not affected by fungi and insects do not relish its sap, and yet it is seldom seen in our towns and villages. A few years ago, an acquaintance in a neighboring county sent a specimen of this plant to the writer for identification. She said that it was so persistent that she had despaired of destroying it, but thinking that it was a weed, had cut it down year after year. Upon being advised that it made a very ornamental vine, she transplanted it to her porch and was delighted with the results. In northern Minnesota it is used as an ornamental porch vine and grows with almost tropical luxuriance.

The blood-root, whose star-like blossoms are seen on the borders of woodland and in sunny places within the groves, become easily acclimated when transplanted and blooms year after year when few other plants have awakened from their winter's sleep.

These native flowers have many admirable qualities. First of all, they are hardy and with a little care when first transplanted become easily established, after which they ask no further consideration; their delicate beauty harmonizes with the landscape. If we expect the composites of the late autumn, there are few native flowers in Iowa that flaunt their colors in the face of the observer, as do the exotic geraniums and salvias; they are generally free from fungus diseases, and they are inexpensive.

What a more beautiful shrub for our lawns than the waa-hoo. The wild grape, the clematis and the bitter-wort are quick growing vines, the clematis especially being very fragrant. Ferns ask only a shady place with some moisture and they will send up their green fronds from early spring until frost.

In a paper read before the State Horticultural Society several years ago, the writer recorded the result of thirty years of such acclimatizing made by a lover of flowers in the city of Grinnell, and this was true conservation, though it meant transplanting of plants from their native heaths to the town gardens. Many of these came from woods in the vicinity, which long since have been denuded of their trees and today are cultivated farm lands. Thus, species that for years have been extinct in their original habitat have adapted themselves to a new environment and are increasing their bounds. Four years ago, forty species from this collection were transplanted to the college botanical garden and thus will be protected and become established features of the flora.

On a collecting trip last summer along the Rainy river, the writer happened upon a forest path that would test the skill of a painter to reproduce. The trees extend to the very bank of the river and occasionally a foot path may be seen, leading a short distance up the slopes. Following one of these one day, a scene of enchantment burst before us. On either side the path was bordered by tall jewell weed, whose brilliant orange and gold flowers were poised like butterflies on the slender stalks. Farther back were seen the white umbels of the wild carrot, whose English name, Queen Anne's lace, seemed more appropriate. Tall youth-wort was still beyond; a tinkling brook could be heard as it found its way over the rocks to the river; the carpet underneath was of green moss; dotted with the graceful partridge berry, pyrola, bishop's cap, the low cornel and trailing twin-flower. Following the path, we came to a very thicket of ferns and brakes, while around and overhead were the waving branches of birches, firs, cedars and cottonwoods. All of this was within a few blocks of the largest paper-pulp mill in the United States and I have wondered many times whether this mecca of nature lovers would yield in time to the so-called march of improvement, or whether the people of the city would save this strip. In my collection, made within a space of not more than four thousand square feet, were not fewer than two hundred species of native flora.

Are there not resources in every county that could be developed in order to preserve our native flora? Cannot a concerted effort be promoted to make each county school yard a flower preserve? The writer is aware that many times the pupils of the rural schools who with much enthusiasm has set out their wild flower beds in the spring, return in the fall to find that the grounds have been used as a neighborhood pasture, or that the director in preparing for the fall opening has ruthlessly mowed everything in sight. Can we blame the children, if they lose interest in this work? Oftentimes, too, the school grounds are unfenced. However, these conditions may be changed if the interest of the patrons is once aroused. To encourage establishing native trees, shrubs and herbs on country school grounds very definite suggestions should be made to teachers and pupils.

It is not enough to appoint an arbor day and hope that in every district such planting will be done. Few teachers have had practical experience in transplanting trees and shrubs, but the great majority will endeavor to do this if definite suggestions of what to do are made. It is not enough to make resolutions at such a meeting as this. Neither county superintendent nor rural teacher is likely to see the report. Could not circulars be prepared and sent to the county superintendent for distribution among his teachers, in which working lists of plants to be set out and methods of doing this are clearly noted? Let me suggest that these lists be short and include only such plants as are easily accessible. It might be well, also, to caution against such plants as anemone, *Pennsylvanica*, *Desmidium* and *Hydrophyllum*, which soon become weeds.

It is not enough to say "Set out some shrubs and other plants," but if we say "Set out wahoo and wild honeysuckle in the yard, plant moon seed and woodbine by the porch, set out bitterwort by the fence, place a clump of hawthorne and wild crabapple on a slope, set out hepaticas, blue bells, columbine and bloodroot on the south, anemones on the east and ferns on the north side of the house and ask your director to see that the fence is good, moreover, save religiously every flowering plant and shrub already native to the school ground; if it is not advisable to retain them there, transplant them carefully to some more suitable part of the ground,"—if we speak thus definitely, teachers, school children and neighborhood will vie with each other in carrying out directions. The plants named have been selected advisedly because they blossom while the spring term of school is in session. The bitter sweet, haw and wau-hoo are attractive because of their fruit when school opens in the fall; moreover, they all may be obtained easily from the nearest grove.

The organization of consolidated schools offers a like opportunity, since an essential condition of such consolidation is that the grounds be ample and in each school there is a teacher of agriculture.

Every county, we might say every town, should have its picnic grounds and these should be left as far as possible in a state of nature, where both fauna and flora might be preserved. Cannot any game preserves, of which there are many in the state, be made preserves of native flora also? Mormon Ridge in Marshall county has a very extensive flora. The owners of the timber land are foresting it carefully. It has been a

game preserve and if the same care could be taken of its flora, that is taken of its birds and trees, it would remain a valuable heritage for all time. It is easily accessible by rail.

Along the Squaw creek, perhaps a mile and a half from the Iowa State College buildings, is a little bit of ground known to students as "the patch." To reach it formerly we found our way by no well-marked path, but rather by a sense of direction, over the ridges, or along the stream where sometimes trees reached so far into the water that only by clinging to the trunk and swinging around it could one continue his way and finally come to this most picturesque portion of the farm, which was at high water an island, literally carpeted with violets. Beyond are the wood anemones bounded by a curve of hawthorn trees. The violets are a little darker than those that grow elsewhere, the stems a little longer and constant picking only increases the number of blooms. When groups of students come in from the north woods laden with these beautiful flowers, we know, regardless of the calendar, that spring is here. As the road builders approach this bit of fairyland, thus making it accessible by carriages, we hear on every hand the mournful query, "Will the violet patch too be exterminated?"

On a steamer trip to Kenora, the northern part of the Lake of the Woods, a beautiful island is passed sixteen miles out from the city. This is the municipal picnic ground, than which none more beautiful can be found anywhere. There is a sandy beach for bathing, virgin pines, firs, birches, spruces and maples offer shade and in season there is a wealth of native flora that has never been disturbed. As we rounded the point not long ago, we met a couple of launches filled with a merry party on the way to the island for an evening of enjoyment. Several in the boat spoke of the far-sightedness in saving this island for the people.

Our city and country cemeteries offer opportunities not to be overlooked for establishing native flora. In the small rural cemetery near one of our country churches is a plantation of the orchid, *Spirantheas cernua*, that is found only in that one locality in a large radius of territory.

The golf and country club is becoming more and more a recognized factor in the small city's recreational resources. The grounds, owned or leased, usually contain a strip of woodland bordering a running stream. Cannot the custom be established of creating a native plant preserve in a park at least of such territory?

The movement for conservation of our national resources is one that is gathering force year by year, and it is for us to help it by practical means.

It may be long before extensive botanical gardens and arboreta are established in Iowa. Meanwhile let us use the means at hand, school grounds, parks, cemeteries, country clubs, bits of forest land here and there, and exert our influence to forward the growing tendency to look upon the great field of nature as a heritage of all the people to be preserved for the use of all, not only as a source of recreation, but as an historical record of the flora of our beautiful Iowa.—Iowa Forestry and Conservation Association, Report 1914-15, pp 80-88.

BIRD CONSERVATION IN IOWA.

By B. H. Bailey.

It would be difficult to emphasize too strongly the need that exists for farther conservation of our Iowa birds. Their value from an economic standpoint even in their reduced numbers, can scarcely be overestimated, and from an aesthetic viewpoint the flowers are their only rivals. That the last quarter century has seen a diminution of their numbers no one can gainsay. Not all species have been equally depleted. The chief sufferers have been those looked upon as game which have been protected at all adequately only within recent years, by limitations of the open season and the restrictions of the bag.

The protection afforded our smaller and economically most valuable birds is, and I believe must largely be, through education. By the impact of cumulative sentiment we may confidently hope in the rising generation to accomplish much. I take it the purpose of this meeting is to plan ways and means for effective conservation in Iowa along all the lines suggested in the topics for discussion.

If we now inquire what agencies have brought about these untoward conditions against which our efforts at conservation are aimed, we must confess that man himself, that disturbing factor against which nature seems never to have provided adequately, is the chief devastator. He is responsible for the considerable reduction of land birds and also water birds of our state which both in numbers of individuals as well as in nesting species are decreased.

The draining of lakes and sloughs as well as the almost ceaseless fusillade of repeating shot-guns have thinned the ranks of the former myriads of migrating and nesting waterfowls. Notwithstanding the extraordinary percentage of arable land of Iowa the greed for more is upon us. May we not one day find ourselves in a similar predicament with that unhappy individual in the well known story, who, in his lust for wealth desired that everything he touched should instantly turn to gold. We may one day wish these natural assets back again but our repentance will come too late.

In the brief time allotted to me permit me to bring to your notice one instance where timely action saved a valuable breeding ground to the waterfowl of a certain portion of the state. In 1902 while on a summer tour by wagon through northern Iowa I first became acquainted with the bird life of Eagle Lake, a tract of marsh and open water covering, by rough estimate, a thousand acres and lying some two and one-half miles north of the town of Duncan, in Hancock county. Here among the cat tails, wild rice, blue flag and other rank growth the waterfowl find shelter and food, while in the grassy swails of nearby fields and along the timbered shore many species less aquatic make their homes. The outlet at the eastern end was so shallow that after the spring overflow, during summers of normal rainfall there remained sufficient depth of water for use of a skiff in most parts of the lake, and at times the overflow through this channel was considerable. In dry seasons the enormous evaporation exposed the boggy bottom for many rods around the margin

and the cattle were wont to feed out some distance from the meander line.

During the summer some five years ago, through the deepening of the outlet by a neighboring farmer, thus preventing the retention of the spring rainfall, and the dryness of the summer which followed, the lake went practically dry in places, and such water birds as still remained were restricted to comparatively limited quarters. Through the co-operation of the state game warden, George Lincoln, and at the urgent request of the Ward Brothers, whose farm adjoined the lake, an earth and concrete dam was built so as to retain water up to a desired level. The effect of this timely interference was noticeable in two ways. There were vigorous protests on the part of certain farmers who had come to believe during the years of drouth that all the exposed acreage adjacent to their property belonged to them and had straightway proceeded to fence it in. The second noticeable result was the swarming of large flocks of ducks and other water birds that, driven in from surrounding ponds which had dried up, came to this refuge where, by the scores and hundreds, they could be seen standing on the mud flats and rat houses or swimming in the open water. Gallinules, rails, coots and snipes, herons, grebes and bitterns were observed in large numbers, and I have never seen so many ducks at one time before or since. This comparatively small outlay was amply justified in that one season and many times since. I have visited this lake again and again and always with pleasure and profit. On its shores in an oak wood some 200 pairs of black-crowned night herons have nested. Decimated by hunters and frightened they have shifted their heronry from place to place. First located in the willows of Wood lake, a small marsh near Eagle lake, and draining into it, they next went to the poplars and oaks a mile away and nearly a half mile from open water. A year ago they had again moved to an oak covered hill nearer the marsh where in the tops of the second growth they were better concealed and less liable to the attacks of hunters, and their eggs were safe from marauding crows. Considering a few similar places in Iowa where wild fowl may breed, the destruction of this lake would be little short of a crime. If there is one legitimate use more than another to which the hunters' license money might well be applied it is the conservation of Iowa's limited water birds.

As in other reform and conservation movements Iowa has furnished great leaders, so in this effort to conserve the wild life of this continent no greater leader has arisen than champion of the migratory bird law, Dr. W. T. Hornaday. In his very soul he believes in his work and his aggressive spirit and tireless energy have been given free rein in the accomplishment of his herculean task. His convincing arguments and his personality won others to his standard, but it was no easy fight to route vicious practices such as plume hunting and spring shooting when entrenched behind the almighty dollar and the lust to kill.

May there not arise another Iowan of similar abilities and kindred spirit who shall be able to accomplish for our state what Dr. Hornaday has accomplished for the nation, and shall not we who teach, whether in university, college, or country school, bring to bear the conserving

forces of education to the end that our Iowa birds may not perish from the earth.—Iowa Forestry and Conservation Association. Report 1914-15. pp. 31-4.

WILD BIRD PROTECTION IN IOWA.

By George Bennett.

It is much too late in the day to plead the necessity for bird protection either on moral, aesthetic, or material grounds, as all this has long been conceded by a sufficiently large portion of the thinking section of the world, to establish it permanently in the curriculum of everyday life.

Suffice it to say, that, among other things, we lay down the principle that bird protection is wise, because of the provided economic value of the birds in feeding so largely on grubs and insects that prey on vegetable life and on weed seeds which are a menace to crops. Also, the study of bird life is a particularly valuable factor and fascinating medium in the education of children, as well as adults, who, in the study of birds—their variety, characteristics and migratory instincts, find a subject worthy of much study.

Starting out from the premises that the birds should be protected, we inquire how? They have been intentionally decimated and destroyed with a determination and persistence that presents an unusually dark picture to the nature lover. Again through the march of what we sometimes call civilization, the settler has so changed the physical conditions of the territory which he has invaded, that the swamp and thicket which previously gave food and shelter to a variety of birds, have disappeared, and naturally our feathered friends have disappeared with them.

It may be taken for granted that we all have read what that mighty champion of the cause of living things, Dr. Hornaday of New York, has to say in his book, "Our Vanishing Wild Life." In summing up the situation he would like to know, "What is to be done?"

We will consider briefly a certain phase of our subject which stands squarely in the way of dealing with it scientifically, and then address ourselves to advocating certain specific things which should be done at once in our own state.

If we would preserve our birds from being killed, we must curtail the hunting spirit. At its worst the hunting spirit is bad and the shotgun a diabolical weapon. This spirit should pass out of our civilization, being utterly incompatible with our cause and having nothing but barbarism and a vicious custom to recommend it. The plea made by its votaries that healthful and invigorating field and woodland experiences are its accompaniment can be applied with equal and much more rational force to the man who fires shots with a camera and obtains infinitely more desirable results. Some hunters see in the steps taken to protect bird life only the furnishing, at a later date, a greater number of victims for their guns. This great hindrance standing directly in our path of en-

deavor, should be removed by the support of all true sportsmen. Total prohibition against shooting, for the present at least, and possibly for many years to come, would be a logical course to pursue with respect to such birds as are in danger of being depleted or exterminated. It reminds one of another evil in the world for which various expedients have been recommended and adopted, but all in vain, and the nation is calling in loud and ever accentuated voice for the only adequate remedy—prohibition.

Assuming for a moment that the so-called sport, as applied to shooting of birds, is legitimate, is it not fair that one individual should have equal rights with another in pursuing it? If this is so we are immediately confronted with a host of nimrods for whom our hunting territory is much too contracted, and where the available supply of birds will by no means go round. Far better that the boy from the beginning should be taught that the shotgun is often a menace to the enjoyment of outdoor life and that the true, heroic, the allsatisfying thing is to protect, increase and propagate the beautiful in nature. But we hear some saying in following this doctrine we would be overrun with our denizens of the air to our great detriment—however this would not happen in a year, nor in twenty years. Let us at any rate practice prohibition until the demand for Paris green, hellebore and the like has materially decreased, and the birds are with us in sufficient numbers to police our crops, as of old, thereby restoring outraged nature's balance.

And now for a moment, to return to Dr. Hornaday's question, "What is to be done to protect our birds in Iowa?" On page 281 of Dr. Hornaday's book he has this to say of Iowa: "It is said that the Indian word 'Iowa' means the 'drowsy' or 'sleepy ones.' Politically and educationally, Iowa is all right, but in the protection of wild life she is ten years behind the times in almost everything save the prohibition of the sale of game. Iowa knows better than to pursue the course that she does! She boasts about her corn and hogs, but she is deaf to the appeals of the states surrounding her on the subject of spring shooting. For years Minnesota has set her a good example, but nothing moves her to step up to where she belongs in the phalanx of intelligent game-protecting states.

"The foregoing may sound harsh, but in view of what other states have endured from Iowa's stubbornness regarding migratory game, the time for silent treatment of her case is gone by. She is today in the same class as North Carolina, South Carolina and Maryland—at the tail end of the procession of states. She cares everything for corn and hogs, but little for wild life."

She will not take up this challenge and, as we claim in so many things to be first, place our state in the forefront as regards the protection of our bird life? There are two things to be done—education and legislation. A definite and permanent plank should appear in the common school curriculum, especially in rural districts, where from the very first the children should be trained in the economic importance of bird life. The National Association of Audubon Societies has a standing offer to every public school teacher in the country to supply very attractive bird literature on easy and inviting terms, but our Iowa State Board

of Education desires to go a step farther and makes such, or similar work, compulsory.

In addition education should proceed through agricultural institutes and clubs. The granges of the state, particularly, should give more attention to this subject. From our own contact with our farmers, we find them alive to the importance of this subject and ready to co-operate. The remark has been made to us, "I would as soon see a person take a chicken from my flock as a quail from my pasture." If a state law becomes effective in prohibiting shooting of every kind, all the time, many a farmer would give a sigh of relief since he would no longer be accosted with requests to hunt over his land and his feathered helpers would be interfered with no more, but would be permitted to perform their good offices without molestation.

This would effectually pave the way for a campaign of education among agriculturists who are the natural custodians of the birds, regarding the bringing back of some of the old conditions favorable to bird life, but which have disappeared in the onward march through draining, cutting down, and leveling up. Naturally, the thrifty farmer desires to see all his land so cleaned up and prepared, that there is no suggestion of swamp, brush or weed patch. For himself alone, from a certain standpoint, this may be all right, but from another angle, radically wrong. In his endeavor to emulate his good wife in the cleanliness and order prevailing in the home, he overlooks an important factor of outdoor economy. He has a host of helpers in the birds which he cannot well do without, and he has not given the least thought to their protection and care. Thus, we see he has been delinquent, largely because he was uninformed, hence the necessity for a campaign of education in order that the birds may be provided with suitable nesting thickets, certain wild fruit trees for supplying their food, and special food, when, through the severity of winter the creatures are cut off from their regular natural supplies. The campaign of education needs the support of legislation which we should seek when our representatives from the various counties meet in this city for this specific work. A good start would be made in the appointment of a state ornithologist. When little states like Massachusetts and Connecticut have these, Iowa certainly should. We have with us here the text of the bill establishing this office in Massachusetts about six years ago, when our friend E. H. Forbush was chosen for the post and has continued in the position. At a later date, at the suggestion of Mr. Forbush, which it was the writer's pleasure to assist in carrying out, another friend of ours, Herbert K. Job of West Haven, Connecticut, was chosen as state ornithologist for Connecticut, who has recently resigned to become consulting ornithologist of the National Association of Audubon Societies. Both these names will doubtless be familiar to many in this room.

The ornithologist would naturally be state game warden. Under and in association with him would be a warden for every county, while this official should have affiliated with him a warden for every township, the latter to be honorary and serve without pay, except in special cases, when a rural minister of the gospel would doubtless feel it his duty to act as township warden.

With the formulating of plans such as these above outlines, I believe we could better protect and preserve our beautiful and beneficent bird life.

PROTECTING THE MIGRATORY BIRDS.

By Charles F. Clarke.

I am in receipt of a telegram from W. T. Hornaday of the New York Zoological Park, which reads as follows:

"New York, N. Y., April 11.—Charles F. Clarke, Adel, Iowa: The federal migratory bird law is in danger of being rendered ineffective through lack of funds to meet legitimate costs of enforcement. Senator Robinson of Arkansas is trying to cut out all funds from the agricultural appropriation bill. Arouse your state to demand of your senators \$100,000. Quick and strong action is imperative. W. T. Hornaday."

Certainly Mr. Hornaday ought to be loyally supported in his effort to have the migratory bird law made effective. Especially here in Iowa should the people give their support unqualifiedly to the efforts to preserve the birds. Probably there has never been any place in the entire world which has been a home for as many and varied a species of migratory waterfowl as has been the territory in the upper Mississippi valley now embraced within the limits of the state of Iowa. When the pioneers first crossed the Mississippi river and stepped on the soil of Iowa they stepped on a hunter's paradise. When the ice of the great river was breaking up and when it went creaking and cracking through the willows along the shore the flight of waterfowl from the south was on. And will the people of Iowa ever see such a sight again?

Then the land was new. No one but the Indian made it his home. The wild things of nature were undisturbed. The deer lived in the bottoms along the river, the lordly elk shook his mane in the morning breeze and from the rugged bluffs that overlooked the "Father of Waters" greeting the sunrise with challenge of freedom and defiance. The buffalo roamed the prairies that extended westward toward the setting sun and on the high prairies far toward the Missouri river the antelope in graceful bands grazed on the grass of the prairie. But behold the waterfowl on their spring journey to the northland! With the utter abandon of perfect freedom they came in long lines over the southern horizon—great V-shaped flocks of geese and brant and innumerable hundreds and thousands of mallard and teal, widgeon and pintail, and all the rest of the wonderful and beautiful array of feathered folk that make up the galaxy of America's waterfowl. Who ever saw that flight of ducks and geese on a bright spring morning a little over a half century ago must have felt a thrill of life in his soul that made him glad to be alive and that made him worship at the shrine of nature pure and undefiled as it was on that glorious morning. Out of the bayous along the shore where the willows and cottonwoods grew in profusion the feathered throng kept coming and going. With whistling wings grand flocks of mallards would swish by with a rush and alight with a splash in the nearby water and at the same time with loud splashing and

quacking others of the birds would rise laborously up through the trees and make off northward until they were lost in the rosy depths of the sky. And still they came, immense flocks of them streaming northward with joyous honks and quacks heralding the morning, the springtime, and proclaiming the grand goodness of life. And as the ducks and geese came northward, as every bend in the magnificent river afforded rest and shelter for the waterfowl, as the sandbars were crowded with the Canadian geese choosing their mates and making ready for the new season, the song birds also voiced their gladness and as the sun's rays gradually dispelled the white mists of the river and the deep gloom of the heavily wooded shores, the whole grand chorus of robins, blackbirds, and a myriad of others hardy enough to go northward with the ducks, chirruped and caroled the gladness of the morning. It was a wonderful sight--a glorious experience for those who saw it and heard it and felt it. Truly it must have seemed the dawn of creation itself when the great creator made the earth and sky, the rivers and the sea, and peopled them all with a glorious throng.

But will it ever be seen in Iowa again? Will it ever be heard or felt or experienced? The elk and the buffalo are gone, and the antelope are no more in Iowa and probably never will be. And the feathered throng of waterfowl and songsters that come up the river in the spring have dwindled to sadly decimated numbers, and the glory and the freedom of the new day has very largely departed. The ducks and geese now come in scattered flocks, the song of birds has decreased in volume, the woods along the shore have in a large measure disappeared, and the river itself is not the mighty and full flowing stream that it used to be. The pigeons that once were seen in greater numbers than even the waterfowl have vanished from the face of the earth. They will never be seen again.

The pioneer who first stepped on Iowa soil stepped on a promised land. He saw it in its primitive, elemental glory. The hawthorn and wild crabapple trees were in bloom, the grass of the prairie extended westward in gentle undulations like a wonderful lawn interspersed with clumps of budding and flowering trees. Over the soggy prairie the wild swan winged his way, and in the evening glow of sunset could be made out flocks of sandhill cranes laborously winging their way northward, while their guttural but musical notes came faintly to the ear from a great height in the soft spring air. In the morning when the sun again flooded this new land with light, the booming of prairie chickens could be heard on every hand, and flocks of them could be seen swiftly flying from one part of the prairie to another. The marshes and lakes were being filled with waterfowl that stopped in Iowa to spend the summer and raise the young ducklings which should add their number to the already multitudinous numbers that flew over the fair land of Iowa.

The pioneer came into a promised land but he was greedy for the treasures that the land offered and thinking that such incredible numbers of wild creatures could never be destroyed and thinking that such boundless acres could never lose their fertility and thinking that such great stretches of woodland could never be cut down, he began with all his might to slay and destroy and confiscate. The result is that we have a

great commercialized civilization in Iowa but many of the fairest and rarest of Iowa's treasures have been trodden under foot.

Civilization in Iowa is on a commercial basis. The aesthetic, the ideal, the beautiful, the elemental has had to give way before commercialism. As a people our character has suffered as a result. We miss from life things that should not be missed. The modern tendency is to disregard everything primitive, everything elemental, as being relics of barbarism. Nevertheless the poet who penned the following lines probably had a deeper insight into life than has any captain of industry:

They saw the silence
Move by and beckon; saw the forms,
The very beards, of burly storms,
And heard them talk like sounding seas.
They saw the snowy mountains rolled
And heaved along the nameless lands
Like mighty billows; saw the gold
Of awful sunsets; saw the blush
Of sudden dawn, and felt the hush
Of heaven when the day sat down
And hid his face in dusky hands.

And Walt Whitman probably was more deeply happy when he wrote the following lines than was ever any man to whom nature means nothing:

In vain the speeding of shyness,
In vain the elk takes to the inner passes of the woods . . .
Where geese nip their food with short jerks,
Where sundown shadows lengthen over the limitless prairie,
Where herds of buffalo make a crawling spread of the square miles, far and near,
Where winter wolves bark amid wastes of snow and ice-clad trees . . .
The moose, large as an ox, cornered by hunters, plunging with his forefeet, the
hoofs as sharp as knives, . . .
The blazing fire at night, the sweet taste of supper, the talk, the bed of hemlock
boughs, and the bear skin.

Indeed so far have commercial ideals governed us that we cannot now produce any literature that will compare with what was written a few generations ago. And this is not an idle statement. It is made deliberately and for this reason—that in the literature of a few generations ago there was a deeper realization of the presence of a creator of the universe in all things and this realization was more especially felt through a love of nature and things elemental and things primitive. For instance Cooper's Leatherstocking in speaking of his religion and of his scorn for books says:

“’Tis open before your eyes, and he who owns it is not niggard of its use. I have heard it said that there are men who read in books to convince themselves there is a God. I know not but man may so deform his works in the settlement, as to leave that which is so clear in the wilderness a matter of doubt among traders and priests. If any such there be, and he will follow me from sun to sun, through the windings of the forest, he shall see enough to teach him that he is a fool, and that the greatest of his folly lies in striving to rise to the level of One he can never equal, be it in goodness, or be it in power.”

Even our religion has come to be largely a matter of form and in it as

in literature there is much refinement of learning but little genuine faith or reverence.

We have gone far away from things elemental, from things primitive that are deeply associated with and inseparable from healthy, normal, vigorous life. We need to get back to the things we have lost and certainly a good beginning would be to assist in the effort to get congress to appropriate money to enforce the federal migratory bird law and get so far as possible the song birds and waterfowl that have been slaughtered so ruthlessly for half a century.

This, then, is an earnest appeal to everyone to write to the Iowa senators to support the effort to raise \$100,000 for the purpose of enforcing the federal law.

And for fear of appearing two-faced the writer of this article must declare that ever since he has been able to carry a gun he has hunted ducks and geese and other game birds, and that he has sat by the hour in a howling northwest wind near the edge of some prairie pond in the hope of getting one or two shots at ducks that might chance to come his way. He must say further that there is no sport or pastime that rests nearer his heart than duck shooting, but in spite of it all he will gladly put up his gun during the spring season to the end that the birds may be restored to something like their former numbers and that his children's children may see the sandhill crane in the sunset glow and hear the ducks and geese passing northward in the night.

Let us all respond to Mr. Hornaday's appeal.—Iowa Forestry and Conservation Association. Report 1914-15, pp. 25-30.

IOWA'S WATERFOWL, SHORE AND MARSH BIRDS.

By J. A. Spurrell.

In the days before the settlement by white people Iowa abounded in wild ducks, geese, swans, and all marsh and shore birds native to this section. Many of these birds bred abundantly in the state, especially in the northern part. This condition continued until about forty years ago when a rapid decrease began.

At the present day, but few ducks and no wild geese and swans breed in the state, while most of the shore and marsh birds must go to the far north to breed. Furthermore, if the present craze for the drainage of all swamps and marshy lakes which can be drained, continues, it will be only a short period until no wild ducks can breed in the state. All their resorts will be drained. Ducks cannot breed on the open lakes, so much sought by human beings on hot summer days. The ducks require a tangle of reeds, and marshes plants of our swamps and swampy lakes, to furnish shelter for their nests, also to furnish food and protection for their young.

When Iowa has drained all her marshy lakes and swamps, she will be in the position where she raises no ducks, protects no ducks (under the present state law the ducks will migrate north receive no protection because they are out of the state during close season) and yet Iowa takes large toll from both the northbound and southbound flocks.

Further, Iowa lies directly across the main migration paths of the ducks of Minnesota, portions of North and South Dakota and a large section of the duck regions of the prairie provinces of Canada. These sections constitute the main duck breeding grounds now remaining, and in these regions spring shooting is prohibited. Yet the majority of the organized hunters of Iowa wish this condition to continue, as proven by their action before the last two legislatures when measures prohibiting spring shooting were introduced. The state of Iowa does not yet conform to the federal law prohibiting spring shooting.

There are about one hundred thousand hunters' licenses issued in Iowa every year, and the bag limit on ducks is 25 per day per hunter. This makes it perfectly legal if all the hunters were out and each got his limit, to kill 2,500,000 ducks in one day. In addition to this the hunting season is 196 days long, making possible a maximum legal kill of 490,000,000 wild ducks. Beyond all doubt this exceeds the number of ducks that pass over the state in either spring or fall. Of course the hunters are never all out at once, the ducks are absent in winter, and the wariness of the wildfowl is such that the bag limit is seldom obtained. However, the computation just given will show what is legally possible under the present state law, as there is no place in Iowa where wild ducks are protected at all times by the game laws.

While I admit that the present drainage district law is of great benefit to the state, and is a necessity to the state's development, I contend that there should be some exceptions in its application. I do not believe that the present generation has the right to destroy all the natural assets of the state among which I would include the wild waterfowl and the beautiful and curious plants which grow in the marshes. Since the state attends to the drainage of the marsh lands, she should also attend to the preservation of portions of them. So far the state has sadly neglected the natural beauty and valuable wild life. It seems that if any marshes are preserved it will have to be by individual or organized effort.

It would be an ideal condition, if there existed in Iowa about fifteen tracts of swamp or marsh land, of 500 to 1,000 acres each, dedicated to the perpetual protection and preservation of our wild waterfowl, marsh and shore birds, as well as the native plants which grow in such locations. These tracts should be under the control of the state or some special organization, which should prohibit all hunting and excessive flower plucking on them, with wardens to enforce the laws.

If these tracts or bird sanctuaries could be ideally located, the plan which appeals to me would be to have three along the Missouri river, three along the Des Moines river, the same number along the Mississippi river, and three each along lines drawn north and south between these rivers. I doubt if it is now possible that many tracts of marsh land, suitable for bird and plant sanctuaries, are left in the state, especially in the sections away from the rivers. Under the present drainage law it would be necessary to secure the control of all the swamp lands in the watershed, or some other landowner could compel the establishment of a drainage district. Such sanctuaries, if they are ever secured, would insure

that a "seed stock" of ducks would escape every migration, and it could no longer be said, "Iowans wish to kill every wild duck that flies over her soil," which could be truthfully said at the present time.

Has not Iowa a philanthropist who will buy a suitable tract of marsh land and protect the birds and wild flowers on it? Ten years from now it will be too late, as there will be no marsh land left except possibly along the border rivers.

The sanctuaries could be used as public parks, whenever such use does not interfere with the purpose of their establishment. Swamp and marsh land have a beauty all their own and varying with the season of the year. This beauty is more easily destroyed than that of woodland, making necessary adequate control when used for park purposes.

For fear that some people will say that there are few birds and flowers which are found in such locations, I append a partial list of these which may be found in such places in Iowa.

The sweet-cented water lily, bladderwort, wild iris or blue flag, three species of arrowhead, pickerel weed or water hyacinth, green dragon or dragon root, cat tail flag, bur-reed, reed canary grass, three species of duck weed, fourteen species of pond weeds, and a great many species of rushes.

The water-lily, iris, arrowhead, and pickerel weed are among the most beautiful of flowers, wild or cultivated. Around the borders of the marshes may be found the skunk cabbage, orange red lily, Turk's cap lily, closed gentian, and many others which grow only in moist places.

Pied-billed grebe, black tern, and Franklin gull are common. Gadwall, baldpate, green-winged teal, blue-winged teal, spoon-bill, pintail, red head, canvassback, the blue-bill ducks, and the buffle head are part of the ducks found. Snow geese, blue geese, Canada geese, white-fronted geese, and whistling swans are found. The bittern or shypoke, least bittern, great blue heron, green heron, and black crowned night heron are to be found nesting or as migrants. The king rail, Virginia rail, sora rail, Florida gallinule, and the ever-present mud hen are found nesting there. Of shore birds there are many. Wilson phalarope, avocet, woodcock, Wilson snipe or jack snipe, dowitcher, stilt sandpiper, pectoral sandpiper or grass snipe, Baird sandpiper, least sandpiper, red-backed sandpiper, semi-palmated sandpiper, marbled godwit, greater yellow-legs, yellow-legs, solitary sandpiper, willet, upland plover, black-bellied plover, killdeer, semi-palmated plover. Of birds which are usually called land birds but which nest or frequent swamps and marshes there are many in number and variety. Bobolink, yellow-headed blackbird, red-winged blackbird, swamp sparrow, Maryland yellow-throated warbler, long-billed marsh wren, short-billed marsh wren, are found nesting in our marshes. The marsh hawks and short-eared owls also nest there.—Iowa Forestry and Conservation Association. Report 1914-15, pp. 70-4.

WHAT BIRD CONSERVATION MEANS.

By T. C. Stevens.

The Journal of April 16 and 17 contains an anonymous interview attacking the principles of bird conservation, and some legislation for that purpose, which seems to call for some reply. There are two or three specific points which I wish to review.

I am familiar with a good deal of the scientific literature on the crow and the bluejay, and I am not aware that there is any great plea for the protection of these birds. There is a good deal of literature discussing their value pro and con. The result of careful study seems to show that they are not wholly injurious. This fact, however, need not be twisted into a plea for their protection. Of course, gunners wish to have the support of the farmers, and if they can make it appear that the "bug bird" men are working for the protection of two nuisances, they know that we will suffer in the estimation of the farmer, whose support we also greatly desire.

When the crow becomes so decreased in numbers as to be in danger of extermination, it may be time to say a word in his behalf; but there seems to be no occasion for that now. A great deal can be said against the bounty on crows or any other animals. It has proved a failure in practically every other state where it has been placed on the statute books. In Pennsylvania under a bounty act on hawks and owls (the Scalp act) it was estimated that the state (by counties) lost \$2,105 for every dollar saved. However, I will not discuss this point further.

The crow is especially exempted from protection under the state law, but the bluejay is not; the latter is not specially mentioned for protection under the federal law, and there may be a question whether it is included by inference or not. At any rate it would be safer at present to refrain from killing even a bluejay.

The gun club representative directs his attacks chiefly against the Audubon societies. It is true that this organization had a great deal to do with the passage of the migratory bird law, but the bill might never have been put through without the vigorous backing of the American Game Protective Association. This new bird law is supported and upheld also by the League of American Sportsmen, the Campfire Club of America, the Boone and Crocket Club, and perhaps every other national organization of American sportsmen. The "cranks" in the department of agriculture are not the only advocates of conservation, by any means. Every true sportsman the country over, as his attention is drawn to the matter, heartily enlists in the cause of wild life conservation. How can a respectable man do otherwise? What gun club men will stand up and advocate shooting any species out of existence?

Allow me to make one other minor correction. The reference to Iowa being a black spot on the map, in regard to progressive game protection, was not my statement, as the quotation marks clearly indicated, but was extracted from a longer article by that great pioneer in American game protection, Dr. W. T. Hornaday. I wish that everyone might read the entire article and also his recent book on "Our Vanishing Wild Life," which is in the public library.

Now there are hunters and sportsmen. Every one who buys a license to shoot is not a sportsman, by a long shot. There is a certain stamina and principle of fair play in the makeup of a sportsman that is partly or wholly lacking in the hunter or gunner. The latter is only contented when he sees the bird or animal fall headlong to the ground. He loves to kill. He is saturated with blood lust. He takes no interest or pleasure in nature, with its beauties, except as it hides him from his fellow man while he commits murder on some small defenseless bird or beast. How long will our local gun clubs tolerate such standards in the name of sportsmanship? The mere gunner has not the energy, and perhaps the intelligence, to study the habits of the animal and make the hunt a game of skill, always giving the animal an equal chance for its life.

A true sportsman never shoots an animal in or on the water. True sportsmen are coming to realize the unfairness of the pump and automatic shotgun in the hunting of birds. They are the tools of the game hog. The sportsman is sometimes thoughtless in such matters but the game hog has no sense of shame.

Now the bird lovers throughout this state do not desire to see the sportsmen deprived of his hunting. It is for this reason that we advocate moderation. Game is not as plentiful now as it was 15 and 50 years ago. With the settlement of the country it hasn't the chance for existence that it had then. We cannot kill with the reckless impunity of earlier days, without the inevitable result of extermination. Our wild game will go the same road that did the great auk, the Labrador ducks, the Eskimo curlew, the Carolina paroquet and the passenger pigeon, never again to be seen on the face of the earth; to be known to future generations only by pictures and stuffed skins. What right have hunters to do this? They make the mistake in supposing that the song birds and insectivorous birds belong to the people who study birds without a gun, while the game birds belong to the hunters who pay license fees to the state. Nothing could be more in error. The game birds as well as the song birds belong to all of the people, and we have a right to demand that they be protected from extermination, or even serious approach to it. We owe this to the future just as we owe the conservation of the forest, the soil, the mineral resources, etc. Besides, the conservation of the game birds is in the interest of the sportsmen; and real sportsmen see it clearly.

Last year Missouri reduced the daily bag limit on birds from 25 to 10. Last year Illinois, Kansas, Missouri, Ohio and South Dakota either extended the closed season for quail, or gave them absolute protection for five years, at least. When a similar bill to protect the quail for five years was presented to the Iowa legislature it was defeated by a gunclub lobby of which our present state game warden was a member.

Because the title to the wild life of the state rests in all the people of the state, and not in any class, and because all the people are interested and concerned in the preservation of such wild life, both for aesthetic and economic reasons, I advocate that the fish and game warden of the state (or, better, a game commission) be compensated out of the general funds of the state, and not from a special fund created by the license fees of those who hunt, as is the case at present.

As I have indicated above, I do not advocate abolition of shooting. The improvident hunter does that by his actions. I advocate such restrictions in hunting as are necessary to preserve our wild life. These restrictions are made more stringent with the settlement of a country and the disappearance of the game. We cannot expect as good hunting as in the days of the Indians and Lewis and Clark. Some of the principles necessary for such restrictions are:

1. Absolute prohibition of spring shooting.
2. Reduction of daily bag limit.
3. Prohibition of the sale of game (now in force in Iowa).
4. Establishment of protected highways of migration.
5. Birds should be allowed a daily resting and feeding period.
6. Removal from the list of game birds of all birds which are rare or of special value to the farmer.
7. Prohibition of the use of automatic and machine guns. Only by the incorporation of such principles into our state laws, and their adequate enforcement, can we possibly hope to save from extinction many of our game birds.

I also suggest to the people of the state that the fish and game commission has many advantages over the single warden system. Such a commission should include a representative of the sportsmen and of the bird conservationists.

Then all the deputy game wardens should be placed on a civil service basis, as they now are in the state of Wisconsin. Every deputy game warden should be an educational officer as well as a police officer, just as they now are in Wisconsin. The deputies should be advance in rank and salary on the basis of efficiency. In Wisconsin five factors govern the promotion of deputy game warden, viz: Faithful service, reports, compliance with orders, sentiment created in favor of game protection, and impartial enforcement of the law. And "immediately preceding the examination for promotion the state game warden will hold a school for deputies at which technical and administrative problems will be discussed."—Report of Iowa Park and Forestry Association, 1913, pp. 460-4.

GAME PROTECTION IN IOWA.

By T. C. Stephens.

The subject assigned to me on this occasion is "Game Protection in Iowa." It occurred to me that this subject might be treated very much like the school boy treated the subject "Snakes in Ireland." However, as our efforts should be constructive, it will be better to avoid a consideration of the history of this problem in Iowa, and endeavor to accomplish something in shaping a policy for the future.

If, as a state, we have not done all that should have been done to prevent the extermination of our wild life, we may charge it to the past, and to a general lack of appreciation of the importance of action.

In this work, just as in every other department of civic life, officials cannot go much ahead of public opinion in the enforcement of law.

The extermination of any species of life, plant or animal, through the aggressive and destructive agency of man is a matter which may well engage the serious attention of thoughtful men. Unless such species are universally harmful to the existence and welfare of man, their extinction becomes a calamity. Most of us do not understand how intimately bound together are all of the forms of life; and how the interference with any single form will upset the balance of the whole immediate complex of nature, and how the effects of such disturbance go rippling outward in ever-widening circles, till often the original cause is lost sight of.

Man takes the wilderness and converts it into his habitation. Conditions become so changed that the larger wild life can no longer find food, shelter and safety. The environment is no longer fitted to their existence. Many forms of life are then crowded out.

The problem which then faces man is to determine what animal forms, if any, can be of service in the modern and civilized scheme. Much work has been done in the solution of this problem; and we do not need to call upon science to show us many ways in which the wild animal life contributes to the comfort, prosperity and welfare of civilized man.

If one were to take the pains to catalog the various animal products which find a place on the market, no doubt the total wealth represented thereby would far exceed our most extravagant guesses.

Without detailing the many forms of animals which furnish food, we may note the immense value of furs to the human race; what, indeed, can take the place of furs in man's clothing? Only in certain quarters, as in Alaska, have adequate attempts been made to conserve the supply of fur-bearing animals. Long ago the necessity of regulating the taking of food fish was recognized; and in the larger bodies of water this may be considered as under control. The salmon industry on the Pacific coast has likewise been put upon a conservative basis, with good prospects of its continuance. The lobster and shrimp industry on the Atlantic coast has interested itself in developing a rational procedure in the taking of this form of life. A long time ago England took control of the pearl-bearing oyster beds. The pearl button industry of our own and adjacent states has lately come to the realization that the supply of clams in the rivers may be exhausted.

In our greed to obtain, we are in the habit of going after these animal resources just as we go after copper and gold in the earth. We do not stop to think that the supply of our animal resources is spread out upon the earth's surface, and is limited in quantity, and it seems to take time for the realization to dawn upon us that our animal resources, unlike our mineral resources, may be perpetuated if we only restrain our greed and exercise rational methods. The result of greed is inexorable.

It is also a slow process for us to realize that our animal life may be of great value to us in other ways than by yielding to us the products of their bodies, such as flesh, fur, hide, feathers, bones, oils, etc. We do

not realize that often the daily activities and behavior of certain animals are serviceable to us in a remarkable degree; even so much that the animal may be of greater value alive than dead.

In this category, of course, we place the birds, which, because of their peculiar habits and relations in nature, may be regarded as the most valuable and beneficial of all the animal groups.

We may emphasize this relation of birds to man by saying that there is much reason to suspect that birds may be almost indispensable to us. To those who appreciate the enormous destruction of crops by insects, and the prodigious fertility of these small organisms, it does not appear as an idle dream to predict great difficulty in the raising of crops, if the principal checks to the multiplication of insects were to be eliminated. So far as the zoologist can see, there are only two important checks upon the increase of injurious insects; these are predaceous insects and insectivorous birds.

We do not need new laws for the protection of the smaller insect-eating birds, but we need a stronger public sentiment in favor of the rigid enforcement of the laws already on our statutes. The farmer will derive the most immediate benefit from the enforcement of laws protecting our so-called "song birds." Iowa, being primarily an agricultural state, should be ready to take a position of leadership in this matter of economic, zoology and practical agriculture.

While certain rights are generally conceded to the small birds, there are one or two large birds which do not share in this protection of public opinion, because they have the misfortune to be classed as "game birds;" a term which usually refers to their edibility, but which should have quite a different significance. These birds are the bob-white or quail, and the prairie chicken.

The bob-white is much too valuable a bird to be killed as game at any season of the year. He is one of the birds which is worth more alive than dead. He is known to feed upon 135 different kinds of insects, including the potato beetle, cucumber beetle, cutworms, army worm, wire worms, chinch bugs, cotton-boll weevil, and many others.

It has been said that a bob-white eats about seven and one-half pounds of insects and 100 pounds of weed seed per year. The natural life of a bob-white is about ten years. Several beves of quail on a farm are, therefore, desirable because of the service they render.

But these birds are on the verge of extermination in Iowa. There may be a few in certain localities, but there is no denial of the fact that they are practically disappearing. They ought to be given a closed season until they become so numerous as to be a nuisance.

Very much the same general statement may be made for the prairie chicken. The chief of the United States biological survey says this bird is a "valuable ally of agriculture." Mr. Hinshaw further says of it: "Being non-migratory, it is state property, and its fate rests solely with the individual states within which it resides. Considering its past abundance, the fine sport its pursuit affords to the legitimate sportsman, its delicacy for the table, and the valuable service it renders the farmer in destroying his insect enemies, the record of its treatment is a shameful one. In many states no protection whatever was given this bird

until its extinction was practically assured, while in states in which adequate legislation has been enacted, open seasons, too large bag limits and inadequate enforcement of the laws have produced their inevitable effect. Nothing short of a closed season for a term of years will turn the tide and save this noble bird from extinction."

We will hear some talk to the effect that legislation will not prevent their extermination; that they will inevitably disappear with the development of the country, and the severe winters will reduce them, all of which is likely to be quite true. But it should not preclude us from making a vigorous effort to prolong their existence, rather than to aid in hastening their going. We must remember too, that the quail was an abundant bird at one time, if we accept the reports of the pioneers, when the winters were certainly no milder than they are now. The only difference is that the bird could maintain itself against the vicissitudes of nature, but not against nature and man combined.

Whatever will be Iowa's solution of this question, we each now bear a measure of responsibility. Of all the non-migratory birds not already exterminated within our state boundaries, the quail and the prairie chicken are the nearest to this end, are subjected to the greatest persecution, and are receiving the least legal protection.

Since the last meeting of this organization, a little over a year ago, the state legislature has held its thirty-sixth session. Very little legislation was enacted which effected the game laws.

The bag limit on quail and prairie chicken was reduced to 15 and 8 birds a day, respectively. This was a step in the right direction, and it indicates a realization on the part of the fish and game department that these species are in need of some special consideration. I do not believe, however, that these bag limits will save the birds from extermination. Nothing but an absolute closed season for a term of years is likely to be of avail.

It is rather difficult to understand why those who are interested should cling so tenaciously to the small amount of quail and chicken hunting.

It is argued by the state game warden in his last report that to close the season on quail would reduce the income of the game department by at least \$30,000. This assumes that there are 30,000 licenses sold for quail and chicken shooting, which would be a third of all the licenses issued in the state. This would be a point difficult to prove or disprove, but it seems to me that the number mentioned must be much over-estimated.

It is quite certain that hunting is going to decrease with the diminution of the game. There is no uncertainty as to the diminution of game under the present laws. We must expect, therefore, that the present arrangement will gradually bring about a reduction of income from the sale of hunting licenses. The game department is concerned as to whether the income will be sufficient to run the department.

There are several possible solutions to this problem. First, we may so protect our game, and regulate the killing of it, that it may perpetuate itself indefinitely. Secondly, we may let the native game go its way to extermination, under existing laws, and depend upon imported game.

Under both of these plans we may assume that hunting will continue, and that an income from licenses will be sufficient to maintain a game department. Stocking the covers with imported game is, however, the more expensive way, and doubt may be entertained as to whether enough hunting can be thus provided to pay the cost of upkeep. The statistics of the game warden's report show that in 1913, 15 per cent of the expenditures from the "game protective fund" was for "game birds;" and in 1914 this item was increased to nearly 20 per cent. Then besides, this consideration just offered ignores the fact that these birds are good for anything but hunting, or that any other citizens than the sportsmen are interested in them.

A third solution would be for the fish and game department to be financed by an appropriation by the legislature. There are two considerations which make this a sound proposition. The game belongs to the people of the state, not to any group or class, regardless of whether they pay a license fee for taking a share of it. Game in the wild state cannot be acquired in the same sense that land or coal or other stationary resource can be. It is the property of all, and is open to the use of all as are the public waters. The government does not plan to keep the rivers improved by means of a special fund collected from those who navigate such waters.

The income from the sale of licenses would, of course, go to the state as a reimbursement for such appropriation. Under the present system the income is far greater than is necessary to maintain the machinery of the fish and game department, as is witnessed by the balance of \$131,834.49 for the two years ending July 1, 1914. It must be very evident that where such excessive funds exist there cannot be the strong incentive to efficient and economic management that should be desired.

The pecuniary argument, therefore, is that we must permit a certain laxity in the killing of our wild life in order to encourage more hunting in order that funds may be procured for the maintenance of the fish and game department. It is just as logical, however, to argue that as a result of such proposed laxity we will succeed in encouraging a greater amount of destruction, with a definite decrease in our game; and when the game reaches a low ebb, the hunt will necessarily diminish, and the income from licenses will decrease in the same proportion. And then what fund will there be to support the fish and game department? Is it not a far more rational procedure to adopt such methods as will provide a moderate amount of native game by giving it sufficient protection to enable it to propagate?

A year ago, before this organization, I gave in considerable detail my views on certain proposed legislation. It would not be profitable to undertake a repetition of this subject. But there are one or two points which I cannot forbear to mention.

Because of our previous lack of appreciation of the importance of conserving the wild life, we have not attached much importance to the necessity of efficiency in the whole system of enforcing the game laws.

I believe there are advantages in the commission plan for the administration of the business pertaining to this department. However, both the

commission plan and the warden plan are being used successfully in different states, and it appears to be possible to secure sufficient management in either way.

It seems that there would be much less probability of error in policy if the affairs of the game animals of the state were placed in the hands of a commission of variously trained men. A conservation commission authorized by the state of Iowa would take charge of the natural resources of the state, including the forests, the lakes, the wild life, and the state parks when there are any, and determine the policy with reference to the use of these properties. The promotion of such a propaganda I conceive to be the legitimate aim of the Iowa Forestry and Conservation Association.—Iowa Forest and Conservation Association, 1913, pp. 460-4.

CONSERVATION AND
PARKS

Conservation and Parks—

AREY, M. F.
BALL, E. D.
CULLEY, FRANK H.
CURTISS, C. F.
GREENE, WESLEY
HAYDEN, ADA
HORCHEM, B. J.
LEES, JAMES H.
MACBRIDE, THOMAS H.
MCNIDER, MRS. MARY H.
ORR, ELLISON
PAMMEL, L. H.
PEARSE, R. J.
REEVES, ELMER
SHIMEK, B.
TRUAX, T. R.

CONSERVATION AND PARKS.

THE EVOLUTION OF FOREST, PARK AND CONSERVATION SENTIMENT IN IOWA.

By Wesley Greene, Secretary Iowa State Horticultural Society.

I may not be able, in a few minutes, to enframe a concept of Iowa for a hundred years and hold it before your mind in such a manner that you can see the changes that have taken place in that time, but will try to bring into relief some of the more important factors and set them in the fore-ground to give the proper perspective so you can catch a glimpse of the motives that impelled the early settlers to do what they did, while we pass rapidly over a review of this subject.

Iowa a hundred years ago, was a possession of the Indians, however much it may have been claimed by foreign nations prior to that time. You will pardon me if I refer to two gentlemen, it was my privilege to know in early youth as witnesses for the first thirty years, of which I had no personal knowledge, who were active in transition of dominion in the state from the red to the white race.

Antoine LeClaire came to Fort Armstrong in 1818 as an interpreter and served in that capacity in the treaty of 1832, and was the first person to acquire title to land and erect a building in Iowa, notwithstanding occupancy of other adventurers who were temporarily in possession at Dubuque, Flint Hills and elsewhere.

Geo. L. Davenport was born on the island in 1818 and had no play-mates in early life other than the Indian children that lived in villages on both sides of the river and learned to speak their language as readily as English. He staked a claim near that of Mr. LeClaire's that was in the days of "Squatter Sovereignty," the land had not been surveyed and had little commercial value.

Mr. Davenport assisted in the treaty of 1841-2 for the purchase from the Indians of the remainder of their land in the state. They were removed in 1846 but not completely extirpated until 1856 at Spirit Lake. I have given you this much history to serve as a canvas on which to visualize the concept of the emotions of the people who followed the Indians in the building of a great state, one of the richest in agricultural resources in the Mississippi valley.

Settlement did not begin officially in Iowa until July, 1833. In 1836 there were 10,000, in 1840, 43,000, and in 1850 nearly 200,000 people were within our borders. The state was admitted in 1846 and expressed its sentiments and prescribed rules of action to guide its people in the Code of 1851. Up to this time the settlers located among the tree-crowned hills along the streams where the forest area was estimated to cover 15 per cent to 17 per cent of the state. The sentiment of the pioneers was the same in regard to forests as that held by their forefathers; that without forests settlement in a new country was impossible. A glance at the

early history of the pilgrim fathers in their struggles for existence and final triumph in the forests of New England and in the valley of the James will demonstrate their value for in the sparsely wooded region at St. Augustine, the oldest town in the country, little progress was made and that is also true of the efforts at settlement in the barren section of Santa Fe, and at Capistrano and Santa Barbara where the Franciscian Friars tried to christianize and colonize the natives. It was only under the fostering boughs of the friendly forests that the white race was able to establish itself in the western continent; they supplied material to build their cabins, for fences to protect their crops; fuel to keep them warm and to cook their meal, and made it possible to secure game and nutritious nuts for food. The same sentiment dominated the pioneers in Iowa and was the governing factor that impelled, if not compelled them to locate in the forest along the streams in this state, until rapid transportation facilities made it possible for them to secure the material necessary for their comfort from a distance. In 1850 there were few roads and scarcely any bridges, streams were crossed by ferry or at a ford. A yoke or two of oxen supplied the motive power and the only vehicle a farm wagon. Oxen were superior to horses for this purpose, though slower, because they could subsist on the herbage during the journey when their master took his noon siesta or nightly bivouac on the lone prairies.

Here is the pioneer with his ox team, board shanty, or sod house covered with poles and thatched with long slough grass, and family in the foreground. With him it was not a problem of aesthetics, but of necessity. These pioneers were not Rothchilds or Rockefellers with millions at their command; their dollars were few and often of doubtful value. When neighbors came they must fence the land to save their crops, plant trees to protect the home from fierce winds and secure shade from the hot sun of summer, and to give a little privacy to the family. Prior to 1850 black locusts were planted for this purpose, but in time the borers came and destroyed them. They then planted soft maples in rows as they did their corn and cultivated them in the same manner. Boards were too expensive to use in building fences, they were too far from the woods to haul rails and smooth wire would not restrain stock, so they sought other material. In 1860 white willow and osage orange were planted for this purpose. The white willow failed to make a fence, but served for a windbreak and for posts. The osage orange hedge was not a complete success because the farmers would not take time in the summer to prune it properly and it went into discard when barbed wire was invented in the late seventies, and when woven wire was introduced the fence problem was solved. I believe sentiment in favor of forestry was at ebb-tide from 1890 to the close of the century, then it turned toward the flow with a greater appreciation of its economic and aesthetic value. I cannot take time to mention the names of those who labored incessantly to save the trees and to increase the planting of them for decorative purposes and economic uses. It was through their untiring efforts that the prairies of this state have been covered with groves. Since 1900 a commission has been appointed, legislation secured, and now there are more than 16,000 acres of forest reservations under the

care of more than 800 people, so you can see that we have been making some progress in recent years in conservation of the native forests of the state.

The park is the outgrowth of the demand of the people in congested centers of population for a place to rest in the sunlight and fresh air. In the older cities where land values are high, parks were little more than squares with statuary, fountains, a few trees and flowers, but the larger idea of a park includes trees, shrubs with meadows and flowers and vistas flecked with sunlight and shadows, and all the embellishments that landscape art can supply to make it beautiful and restful to those weary in body and mind. In the east this larger idea of the park was accepted about 1850 and sentiment in favor of it has been steadily growing throughout the country ever since. It did not receive much attention in this state until 1880, then cities in the eastern part began to purchase land for park purposes and many are now well supplied with them. Sentiment now is growing rapidly in favor of state and national parks. People are naturally gregarious and must get together occasionally for a picnic and since the land is now nearly all held by private owners they must get permission of the owner or commit trespass. This desire for public grounds has developed rapidly on account of the automobile to provide a place where the weary traveler may stop by the wayside for a few hours rest or pitch a tent and stay a week or two in some shady nook or near placid waters to restore shattered nerves and rest a weary body from the daily grind of an exacting business world. This association has had much to do in creating sentiment in favor of public parks in this state.

Conservation was almost a negligible factor with the pioneer, except the protection of his family and property. The destruction of the native flora has gone on rapidly, some are almost extinct. Of the fauna not much remains, except the cotton-tail, it and the rat seem to thrive remarkably well in the environments of a city. In the early seventies farmers protested against a hoard of nimrods swarming into harvest fields when the grain was in shocks, shooting at chickens without regard to the rights of the owner, oft-times setting fire to stubbles and wounding the cattle. A commission was appointed and out of that effort grew our present regulations for taking fish and game in the state. It does seem a little incongruous to charge for the privilege of carrying a gun and not provide a place to shoot, except into the air or waters of the state.

The removal of trees from the steep hills has caused erosion and destroyed much of their value for agriculture and filled the channels of the streams with sediment resulting in overflows during heavy rains and much damage to adjacent property. But the most deplorable phase of the situation is the practice of befouling the water with the sewage from cities until self-respecting fishes cannot live therein and the life and health of both man and beast are endangered when they come in contact with it. Water is a good conveyor of dross from the home, but it should not be returned to the river again until it is as pure as when taken from the main that supplied it. Here is real work for the medical profession, the sanitary engineers and chemists to remove this source of pollution

from our rivers and thus conserve the health of the people, if they would retain the confidence and respect of an enlightened community.

Let there be no cessation in our work until the water in these rivers is as pure as when it left the clouds from whence it came; until these denuded hills are reforested with trees of economic value and given as much care as an annual farm crop; until our shallow lakes are dredged and the low marshy ground adjoining them is raised and planted with trees for the benefit of the generations that are to follow us.

In closing let me cast a ray of sunshine down the vista of years on that pioneer with his ox team. Behold, they have changed. Where that ox team trailed through the long tangled grass an auto speeds along roads at a greater rate than a railway train of half a century ago. The rough, bony cattle and hogs long, lean and strong of leg that were driven 10 to 40 miles on foot to market have given place to high-grade animals with velvety hides, and hogs that tip the scales at 300 pounds in less than nine months that are rushed to the shambles in an auto truck. The shanty and sod house have changed to mansions surrounded by groves, with shrubs and flowers and all that the decorated art of the landscape gardener can give to make them more beautiful than other estates beneath the shining sun.

Great indeed has been the transformation in the last three score years and ten. I have lived to see the plough turn the prairie sod from the Mississippi to the Missouri river; most of its native flora and fauna disappear, but to my eyes these undulating hills covered with velvety blue grass and herds of high-grade cattle have more pastoral beauty than prairie glens with their fringe of golden rods and sunflowers and herds of buffalo.

"Clasp, Angel of the backward look
And, folded wings of ashen gray
And voice of echoes far away,
The brazen covers of thy book;
Even while I look, I can but heed
The restless sands' incessant fall,
Importunate hours that hours succeed,
Each clamorous of its own sharp need,
And duty keeping pace with all.
Shut down and clasp the heavy lids;
I hear again the voice that bids
The dreamer leave his dream midway
For larger hopes and graver fears;
Life greatens in these later years,
The country's aloof flowers today!"

TOURING IN IOWA'S NOOKS AND CORNERS.

(Iowa Magazine.)

Take another look at the cover picture of this issue. Pretty, isn't it? And yet when I showed that picture to several good friends who live in Burlington, they admitted that they had never stood at the foot of that tiny waterfalls, four miles south of town—and watched it glisten and sparkle in the sunshine that filtered through the treetops.

"Looks like a little mountain valley out west," said one.

Oh! the magic of that word "west." We Iowan's love the beautiful in nature but we have acquired the habit of looking for these things almost anywhere but in Iowa. When we want a little vacation we go to the Rockies, the Sierras, the Adirondacks, the north woods—or some other equally distant playground.

But this is war time—so let us take a two-day inexpensive vacation in Iowa. There are many of these two-day trips, and we will take them all before we get through—but as a starter we will motor down along the Mississippi from Davenport to Keokuk, in June.

One of Iowa's best trans-state roads takes us to Muscatine and offers us a hundred fascinating glimpses of the broad Mississippi. Time and again the gentle lapping of the waves almost reaches the roadside and, if the day be warm, the shade of the bordering trees is tempting—and refreshing. The kids may go wading for this is where Muscatine—the largest button manufacturing center in the world, procures most of its clam shells. If it is your lucky day, you may find a pearl or two, which not only would pay for your vacation, but would leave you enough to buy a good sized Liberty Bond.

Prairie roses—millions of them. "What is more rare than a day in June" sings the poet. There is nothing in nature more fascinating than a day in June—in Iowa.

All along the roadside and pell mell following the fences across the fields are the prairie roses—Iowa's state flower. They seem to have absorbed the pink glow of sunrise as they nod restlessly in the varying breezes they beckon us to come on and on, until in the gathering shadows of nightfall their colors merge with the golden tints of sunset—and they sleep until the morning.

In no section of these United States is the wild rose more beautiful or more abundant.

We pass the U. S. Government fish hatchery at Fairport and if our time permits, a welcome awaits us here. Fish are propagated here for restocking the lakes and rivers of the middle west—but if you decide to inspect the hatchery, you must leave your hook, line and sinker outside.

The road passes through long lanes of oaks and elms and at times skirts the higher hillsides, giving us views of thousands of acres of typical Iowa farms. We may catch a glimpse of the vast tomato fields where the Heinz company grows the "raw material" for one of its famous "57." Possibly you did not know that much of Mr. Heinz's catsup is "made-in-Iowa." Well, it is—and this is a bit of free advertising for him.

Then we go up hill and down dale through the lowlands of Louisa county, crossing the Iowa river at Wapello, Iowa, a typical county seat, aggressive, ambitious and the center of a very productive farming section. Wapello, you know, is Harry Weaver's home, and if you are interested in pure-bred Shorthorn cattle, Mr. Weaver has one of the finest herds in the country—and he is a wonderful host.

Mediapolis, in Des Moines county, is quaint and interesting and deserves more time than we can give it this trip. It is a real Iowa hometown, and some day we will return with our camera and get to know it better.

Supper time of the first day finds us near Burlington and if you are one of those who prefer a hotel to a tent—Burlington offers the best of accommodations. But we will drive on to a point about four miles south of Burlington where we may overlook thousands of acres of verdant lowlands and beyond them, watch the grand old Mississippi flowing on toward the gulf—and obscurity.

One must not take a journey of this sort hurriedly. There must be no desire to reach a certain place at a certain time, or else you will not get these wonderful glimpses into the distances and across the great Father of Waters. Here we will pitch our tent, and eat our supper, and sleep—and if the weather man is real good to us perhaps we may watch the sunrise in the morning.

The spot is ideal for two reasons—not only the vista, but its proximity to a woodpile. When you go camping, remember the woodpile. It saves a great deal of effort that otherwise would be necessary when you build a camp fire.

Those of you who have never cooked your meals in the open and enjoyed them outside the narrow limits of a dining room, have something left to live for. Try it in Iowa some time. Buy a chicken from a farmer—broil it over the glowing embers of a campfire; boil the potatoes; fix the coffee—and, as the deep red moon emerges from behind the distant hills and climbs upward into an unending darkness—eat your fill—and know what it is to be on intimate terms with nature.

In the morning, if the sun rises in full glory, the air is clear and crisp, the birds sing, and all is beautiful. Continuing our journey southward, we hear the rush of falling waters and, looking through the trees we find that tiny fairyland (pictured on the front cover) so pretty and so refreshing that we stop the motor and venture in, wondering how many travelers have passed this way and seen it not. Pictures of such beauty spots as this are used by other states to lure the tourists from far distances.

Our Iowans spend their time and their money to visit those far-away places—unappreciative of what we have in Iowa. Not any of the charm is lost as we approach the end of the little valley, and we might well spend the morning here, in restful solitude, lulled to sleep by the music of the waterfalls.

Another mile or two southward, we pass great fields of purple flowers, growing in a riot of profusion along the roadside, on the edge of forests—and everywhere. The California poppy is not as pretty as one of these, yet that golden flower has been so well advertised, that it is one

of the assets of the Golden State—while this neglected purple beauty of the Iowa prairie springs into being and thrives, and withers away with the returning seasons, its glory unknown because its praises are unsung.

With the wealth of Indian lore we have in Iowa, why is it our fathers selected such atrocious names for some of our rivers? We stop on the bridge for a moment to look way back into the shadows of a limpid stream and are disappointed when we learn it is called Skunk river. From 1843 to 1850 Skunk river was the favorite route of the Argonauts through eastern Iowa and many parties of pioneers assembled along its shores and prepared for a long journey to Oregon and California.

As we cross Lee county, along roads flanked by receding colonades of pines, we remember it was here the Mormons sought refuge in 1838. Driven from their colonies in Ohio and Missouri, they congregated in Illinois, on the east bank of the Mississippi river. There they built a prosperous city which they called Nauvoo, and there they devoted themselves to the profitable arts of peace. In 1840 Nauvoo had more inhabitants than Chicago.

Rounding a bend in the road, ten miles below Ft. Madison, we catch through the gathering dusk, glimpses of this city of Nauvoo, where the Mormon prophet, Joseph Smith, was killed, and from whence Brigham Young led the pilgrimage of his people westward. Scarcely had the Mormons completed the building of their holy temple, the spires of which still pierce the fading skyline, when a storm of hate broke over their heads and, in February, 1846, they sold their property, came across the river to Iowa.

In those days the Mormons owned a large part of the city of Keokuk—all of the town of Nashville, six miles north—and most of the little village of Montrose. Their sojourn in Iowa was brief and all we find is a crumbled ruin of their former occupation. Here, on a bluff that rises three hundred feet above the Mississippi, they built an "institute"—but all that remains is this—and memory. The modern pioneer has transformed the site into a delightful summer resort, and called it Bluff Park. Artistic cottages have been placed here and there in the sheltering shadows of oaks, and, from their verandas, views may be had for many miles across Lake Cooper, created when the waters of the Mississippi were held in leash by the dam at Keokuk.

Looking up from the river toward Bluff Park, the road is picturesque. All over Iowa there are roads like this, but those who insist on a traveling schedule of thirty miles an hour see nothing but the beginning and the end of the journey—like a tourist hurrying through some famous art gallery, intent only on finding the doorways that lead on—and out. It was just such nooks and corners as this that gave our state its name—Iowa, Beautiful Land.

The road into Keokuk is the best in southern Iowa. Its macadam surface has not had time to disintegrate, for it was constructed quite recently by the men who built the great dam at Keokuk. When the broad Mississippi was harnessed, the backwaters flooded this section for many miles—farms and farm houses were obliterated, parts of the towns of Sandusky, Galland and Montrose were washed away, and the people

sought refuge on the higher hills. The old road that bordered the river was inundated.

We will follow this good road into Keokuk, register at the Hotel Iowa—one of the best hostelrys in the state—and call this the end of two real days of war-time vacation—Iowa Magazine, June, 1918.

SOME GEOLOGICAL ASPECTS OF CONSERVATION.

By James H. Lees, Geologist.

Iowa is usually considered as primarily a prairie state, one whose chief aesthetic attraction lies in the satisfaction that accompanies the outlook over wide-spreading grain field or level plain stretching away beyond the farthest ken. In a general way this is true and it is the fundamental factor in Iowa's agricultural supremacy. But it is equally true that within the limits of the state there are many spots and localities which for unique interest or quiet beauty or stately grandeur can scarcely be excelled within the Mississippi valley. Since these are essentially geologic phenomena it is my purpose to discuss a few of them from the standpoint of the geologist.

Unquestionably the most attractive region in this state is "The Switzerland of Iowa," so named by the late Professor Calvin, formerly state geologist of Iowa, because its picturesque hills and deep cut valleys with their winding streams make of it a land comparable with the "Playground of Europe." No one can traverse this region or view its bold front from the surface of the great river which flows along its eastern margin without being impressed first of all with its ever varying charm and then—if he will but pause and consider—with the marvelous history which has made possible such a beauty spot in the midst of the boundless plains of the Mississippi valley.

The Switzerland of Iowa includes Allamakee county and portions of Winneshiek, Clayton, Fayette, Dubuque and Delaware counties, while similar phenomena, though on a diminishing scale, may be found to the south along the Mississippi and its tributaries. Geologically, it is the oldest part of Iowa, if we make exception of a very small area in the northwestern corner of the state, where the rock is older, though the final emergency from the sea may have been much more recent. Therefore, the series of events which is recorded in the rocks exposed in this region is longer and more varied than that comprised in any other area of similar size in the state. It extends from the deposition of the later Cambrian sandstones through the varying conditions of the Ordovician, the Silurian and the Devonian periods with their alternating limestones, sandstones and shales which bespeak changing relations of sea and land, or possibly arid climate, as is thought by some to be represented by the St. Peter sandstone. But what has given to this region its rugged charm is the erosion which has been ceaselessly at work for ages carving deep valleys into the once level plains, sculpturing the massive rocks into bold cliffs and battlemented towers, slowly, unobtrusively, irresistibly wearing

away loose sand or solid ledge until the present picturesque topography has been developed.

This region lies in what is known as the Driftless Area, an area which has not been invaded by any of the great glaciers which covered the state, unless perhaps it was the first, the Nebraskan. Hence not only has the work of the erosive agents been interrupted but the region has not been subjected to the destructive planing action of the great ice sheet. So it is that the unique and beautiful forms resulting from the erosive work of air and water have been preserved under the most favorable circumstances. In the country immediately to the west, on the other hand, such erosion remnants have been swept away by the repeated advance of the ice, the river valleys have been filled and the resulting topography is a level or gently undulating prairie.

One of the striking topographic features of northeastern Iowa, one which becomes apparent with a glance at the topographic maps of the region and is equally evident to the traveler, is the relatively straight course and smooth, parallel walls of the great gorge of the Mississippi, which is in marked contrast with the intrenched meanders and extremely irregular slopes of the tributary valleys. It is as if some giant plow had been forced down the main valley cutting off all jutting headlands and leaving the valley walls steep and rugged. And this is just what has happened. Great floods of water from the melting Wisconsin glacier, laden with rock, sand and silt, poured down the valley, scoured both floor and walls and then filled the valley to the level of the highest terraces of the present day. The lateral valleys, however, and the back slopes of the main valley, which were not subjected to this scouring, have retained their older, normal erosion forms.

There are many beauty spots in this scenic wonderland. Along Oneota river are the great columnar cliffs of Plymouth Rock, the vertical scarps at Bluffton, the ice cave and Mill Spring at Decorah, Elephant Bluff, the Owl's head, Mount Hope and other hills of circumdenudation. The most unique of all these is the Ice Cave. This is a great gap left in the rock by the slipping out of a block of stone along the cliff face. The limestones of the region are honeycombed with fissures and into these the cold air of winter is drawn, to be forced out during the warm days of spring and summer. Coming into contact with the moisture laden warm air of the cave this colder air causes a precipitation of the moisture along the inner walls of the cave and forms during the early summer months a coating of ice which sometimes becomes ten to twelve inches thick. Mill Spring is a gushing stream of beautifully clear cold water which issues from a similar, though probably smaller, rock-encumbered cavern not far from the Ice Cave. In times past the stream from the spring built up a deposit of tufa at the mouth of the little ravine down which it flows. There are countless other beautiful springs in the region and indeed every valley and ravine is a dream of beauty with flowing stream and towering castellated walls clothed with the beautiful green of summer or the glowing colors of autumn.

In a land of universal charm a spot which stands out with especial clearness in the memory of the traveler is the region around McGregor and North McGregor, the region in which it is now proposed to establish

a national park. Especially favored by lavish nature as to river, rock and bluff its charm is never ending and its quiet beauty makes an impress which lingers through the years. The Pictured Rocks, about a mile below McGregor, are an unusual phenomenon even in this land of the unusual. A hundred feet or more of St. Peter sandstone, stained with all the browns and reds and yellows and purples of the iron oxides, in contrast with the translucent white of the pure sand, form cliffs and grottoes and nooks of marvelous colors and patterns, set off by groves and lanes of shady trees.

At Guttenberg and again at the mouth of Turkey river are high narrow ridges nearly a mile in length which separate the tributary valleys from the valley of the Mississippi. The Guttenberg ridge is over 200 feet high, with a gentle slope to the south, and the Turkey river ridge is nearly as high and terminates in a bold rock tower which stands almost a hundred feet above the rivers on either side. These ridges of course owe their existence to the hard, resisting beds of rock which underlie the country, and which withstand to the last the encroachments of time and the destroying elements.

And so one might continue this enumeration at great length, but it must be concluded with one or two more examples before passing to other fields. It is well known that in the vicinity of Dubuque there are many caves, which have been formed by the solution of the limestones along cracks and fissures. Some of these have yielded beautiful specimens of stalactites and similar deposits, as well as great quantities of lead ore, and the caves themselves are interesting features. I well remember my disappointment a number of years ago on going through a cave in the City Railway's park to find that it had been absolutely stripped of all its wonderful stalactitic deposits and transformed into a bare, ugly, electric lighted tunnel. Its beauty was irredeemably gone. Such treatment is nothing short of stupid barbarism. Just west of Dubuque, too, are a number of fine examples of erosion pillars which have been carved out of the hard Galena dolomite. Some of these may be seen from the Illinois Central trains standing guard as lone outposts from the main body which has wasted away during the ages. Such remnants bear in themselves witness that no glacier has invaded the region during the long ages that they have been forming by the slow processes of erosion by the ordinary agents.

Another form of erosion remnant, most unique in a state like ours and of great interest anywhere, is the natural bridges of Jackson county. These are formed by the incomplete falling in of the roof of an underground drainage course, whereby portions are left still spanning the now open valley. They are located about six miles northwest of Maquoketa and together with a large cavern in the ravine they make a very popular resort for drives and picnics.

Outside of the more rugged area of northeastern Iowa there are, of course, many isolated spots of great beauty and charm which are well deserving of the nature lover's attention. Among these may be mentioned the Devil's Backbone, near the northwest corner of Delaware county, various localities along the Maquoketa and Wapsipinicon rivers, the Palisades of the Cedar, near Mount Vernon, Devil's Lane, near Muscatine, Indian Spring, near Burlington, and numerous others of equal in-

terest and value. Entirely aside from their aesthetic value all of these areas are of importance to the geologist because of the illustrations of natural phenomena which they furnish, and for that reason as well as for others they are eminently worthy of care and preservation.

In the great central plains area of the state there are a number of very charming spots, which are all the more noteworthy because of their prairie surroundings. Such are the picturesque valleys of Willow and Lime creeks at Mason City, where the streams have cut the limestone bedrock into steep bluffs and precipices which now are margined and covered with forest growth. On a still larger scale is the gorge of Iowa river at Iowa Falls. Here the river has been displaced in recent geologic times and has been forced to cut a new channel through seventy feet of solid limestone. Several small tributaries have had to undergo the same treatment and the result is a series of gorges and retreats which give the region a rare beauty and rugged charm. The older channel of the river is said to be still discernable to the south of the present one.

Steamboat Rock is another locality of geological and general interest and there are several others along the Iowa, such as the stretch above Iowa City, which owes its rugged character to the vagaries of glacial occupation. The older rocky hills were buried with the drift and when the river, whose location was determined by the topography of the glacial deposits, cut through these to the rock, it must perforce maintain its course and so was obliged to cut deeper and deeper into the massive limestones which lay athwart its path.

Along the Des Moines are many beautiful spots, as at Estherville, at Fort Dodge, the high bluffs above Boone, and the delightful "ledges" below that city, the Red Rock bluffs at the village of the same name, the charming bluffs at Cliffland below Ottumwa, and the numerous points of interest about Keosauqua. There is no spot in central Iowa which offers better natural facilities for a beautiful park than the area on either side of the river midway between Boone and Fraser. The entire 200 feet of the valley's depth shows only glacial drift, and in places the slopes rise from the water's edge in a single sweep and are wooded from base to summit. Of an entirely different sort is "The Ledges." Solid sandstone walls rise sheer from the water and even overhang in places, a carpet of verdure covers the little valley, while trees rise to the summits of the bluffs and form a setting for an exceedingly charming scene. The bluffs near Red Rock and Cliffland are also cut in sandstone of Coal Measures age and are of interest because of their geologic history as well as for their natural beauty.

I have already spoken of the great ice sheets and of their glacial deposits as effacers of those types of topography which are due to erosion. It is partly because of this fact that the western two-thirds of Iowa has so few rock outcrops and hence relatively few spots of charm and beauty. Aside from a few localities and those chiefly along the larger streams, the work of erosion since the retreat of the ice sheets has been confined to the glacial drift deposits, which while easily eroded give rise to the softer, more subdued types of landscape.

But there is a peculiar type of topography which is intimately associated with the depositional work of the last, the Wisconsin glacier, with

the laying down of its load along its margin, and which consists of piled up mounds and intervening hollows, all without order or arrangement. This is known as the terminal moraine and along the eastern margin of the Wisconsin drift it is developed as far south as Hardin county, while on the western front it is conspicuous south to Carroll. An inner moraine formed during the recession of the glacier, reaches intermittently in a broad loop from Winnebago county south into Boone and Greene and north again through Palo Alto and Emmet counties. While it differs markedly from the driftless area of northeastern Iowa this morainic area has many features of great charm. Its great mounds, many of them bare and gravelly, but some timber covered on their slopes or summits, the depressions among the hills, with an occasional lakelet nestling calmly in quiet beauty, all of these make an assemblage which cannot fail to impress him who has eyes to see and a soul to appreciate nature's handiwork. One of these great mounds, Ocheyedan Mound, in Osceola county, has long enjoyed the reputation of being the highest point in Iowa and while apparently it must yield precedence, at all events it is a landmark which is visible for miles around. Pilot Knob, in northern Hancock county, while not rising so high above the sea, rises twice as high above the plains about it as does Ocheyedan Mound, and with its associated lakelet and timbered groves is one of the charms of central Iowa.

The beautiful lakes of north-central Iowa form another group of geologic features which are intimately associated both in distribution and in origin with these moraines, and which comprise one of the most valued and attractive types of Iowa's localities of natural interest. Everyone is drawn by the quiet beauty of a smooth lying sheet of water set like a glistening diamond amidst low grassy shores or steeper wooded bluffs. And so it is that our lake regions appeal to all of us and we think of them and their popularity with justifiable pride.

A lake is one of the most evanescent and transient of natural phenomena. A stream may expand and increase its tributary area until it grows into a river; a mountain may, for a long time, at least, keep pace in its growth with its decay; but the destiny of a lake, and especially of a glacial lake, is as inevitable and as easily foretold as the destiny of a man. And in comparison with the vast stretch of geologic time it is as short lived. For this reason it is all the more imperative that we do all in our power to conserve the lakes we have, to lengthen their lives so far as in us lies, to preserve for the coming generations these gems of beauty in our fields of emeralds.

You are all familiar, by experience or by reputation, with the most important Iowa lakes and I need but to mention them to recall beautiful memories to your minds. In the eastern moraine Clear lake is without a peer and indeed will bear comparison with any in all the lake region of the central United States. In the western moraine, which is much more extensive, the Okoboji and Spirit lake hold easy pre-eminence, but a multitude of other smaller ones are held in warm regard by their local admirers, and certainly lack nothing but size to make them noteworthy. Storm lake is deservedly popular among its circle of friends. Wall lake has attained a wide reputation through its great wall of boulders. The

Twin lakes of Calhoun country are centers of attraction and the same is true of many others in the hill country which affords them lodgement, such as Tuttle lake, on the state line in Emmett county, Medium lake near Emmetsburg, Lost Island lake near Ruthven, and others which will occur to your minds.

Along with their loads of finer material some of the continental glaciers brought down from farther north immense boulders which now lie scattered over the surface of the drift-sheets. Some of these have really enormous dimensions, as for example, Pilot Rock, a boulder of Sioux quartzite near Cherokee, which measures on the ground sixty to forty feet and rises above the surface twenty feet. The Iowan drift, in northeast Iowa, is especially noted for these monuments of bygone events and has more large boulders than any of the other drift sheets in the state. Something should be done to preserve the most notable of these glacial boulders in view of their unique origin and character. If nothing is done to prevent it they will ere long be sacrificed to the desires of their present owners for convenient building material and will be entirely lost to posterity.

Closely associated with the glacial deposits of the state and yet only partly related to them in origin is a remarkable formation known as the loess. In northeastern Iowa it is derived directly from the Iowan drift but along the western margin of the state it owes its origin to the great quantities of silt brought down and deposited by Missouri and Big Sioux rivers. From their flood plains it is picked up and carried away by the winds to be dropped over the clay hills in an ever thinning mantle with increasing distance from the source. I do not recall that I have heard or seen these loess bluffs mentioned in conservation discussions, but there is no room for doubt that both botanists and geologists will agree in commending them for careful consideration. The fact that wind blown deposits with thicknesses of fifty to one hundred feet have been shaped into such striking topographic forms as are found among these bluffs, and the further fact that they bear what is in reality a desert type of vegetation, and this in the most fertile state in the world, are facts which entitle them to recognition in any plans for conservation of our beauty spots. The beautiful park at Council Bluffs with its winding valleys and steep slopes is sufficient witness to what is possible with these loess hills, but there should be preserved in an absolutely natural state, a tract which would permit of the retention both of the original topographic forms and of their remarkable vegetal covering. Such areas are available near Missouri Valley, or near Turin, in Monona county, or in the vicinity of Sioux City, and at other localities where the phenomena are equally striking.

In the extreme northwest corner of Iowa, occupying an area of not over five acres is a little spot which is unique in its interest. This interest arises both because of its rock exposures, which are scores of miles distant from any others in Iowa, with the exception of a similar one a mile away, and because of the fact that this rock is the oldest exposed stratum in the state. It is really the rock foundation upon which all subsequent foundations are laid. This rock is the Sioux quartzite and the center of its interest is the natural depression perhaps twenty feet deep

known as Jasper Pool. This represents the greatest thickness of the exposure in Iowa although on the Dakota side of the Big Sioux the rock has been quarried to much greater depths. It seems much to be desired that along the natural bridges of Jackson county, the Waukon Sphinx, the great drift boulders of the central plains, this little tract might be conserved as a state monument, and so with the larger phenomena in a series of state or national parks might make accessible to all posterity the evidence of the activity of geologic forces, past and present, and keep before our eyes the uplifting, broadening, educative beauties of the realms of nature. Iowa has a group of beauty spots which she may well hold in esteem and to care for them and insure their perpetuation will increase the feeling of pride with which every Iowan regards his state and so will add in every way to the state's resources and attractiveness.—Iowa Geological Survey.—Iowa Academy of Science, Vol. XXIV, p 133.

CONSERVATION OF NATURAL SCENERY IN IOWA.

By B. Shimek, Botanist.

Unfortunately the idea of the preservation of small portions of our state in a natural condition is commonly associated in the minds of many of our citizens with the thought that it is chiefly a desire on the part of hunters and fishermen to save their preserves, or with the other thought that it is a sentimental desire, more or less selfish, to keep these beauty spots for the enjoyment of those who have leisure.

While neither of these concepts does full justice to the cause, both are worthy of consideration, and both should receive attention in connection with other arguments in favor of the preservation of certain portions of our state in a natural condition. The preservation of our fish is a matter of interest and importance not only to the sportsmen but to the many people who use fish for food. In order that our fine native fish may thrive it is necessary that the waters be kept clean and wholesome, and this can be done only when the borders of streams and lakes are left undisturbed by stock or plow. Especially is it desirable that wooded bluffs and slopes be not denuded of their forest covering, both because of the effect on erosion and on tributary springs.

The preservation of our native birds and some of the animals is becoming more and more a matter of importance. Our useful birds must have breeding places, and for this purpose tracts of prairie, forest and swamp should be set off, not merely for the purpose of propagating game birds, but that all of our useful birds might find shelter. Some of our native animals also contribute to the food supply, but even more and more restricted, and the time must soon come when fur-bearing animals will be propagated and protected. For this purpose suitable grounds are necessary. The skunk must have wooded banks, the muskrat requires swamps and banks of streams and these and similar places would be furnished by the preservation of such tracts as are here contemplated.

The preservation of beauty spots for recreation and pleasure comes from no one class, but from all of our people. We spend large sums of money to create artificial parks for this very purpose, why not preserve the natural parks which are scattered all over our state, unfortunately in constantly diminishing extent? The areas best suited to the purposes herein discussed are usually not well adapted to agriculture, and could be used much more profitably for other purposes. Moreover, it is not necessary, it is not desirable, that we cultivate every acre of land simply because it can be cultivated. Our homes are not restricted to places and provision for eating and sleeping, and our lives are not given only to money making. Why should we destroy every vestige of natural beauty in our state simply because someone may make a few more dollars? Why not turn our parks into fields and vegetable gardens, and our street and roadsides into cabbage patches? Why not use the front yard for onion beds, and grow cabbages in flower pots in doors? Surely we can afford to use a little of our state for other than money-making purposes!

There are, however, other good reasons for conserving some of our areas besides the two given.

Our most attractive scenery is in the vicinity of streams and lakes, and in such situations our reservations would be chiefly made. They would there serve not only the purposes already noted, but by the prevention of erosion, and of the washing of miscellaneous materials into the water, and by the exclusion of stock, our streams would be rendered free from pollution, a matter of great importance when we consider the extent to which such waters are used by our cities and towns. The latter must also contribute their share by keeping all sewage out of our lakes and streams.

The prevention of erosion, accomplished by permitting vegetation to grow unhindered along the bluffs, would avert the silting up of the streams and lakes which interferes with other uses of such bodies of water.

One of the most important considerations in connection with the conservation of our waters is usually passed over lightly. This is the need of a source of supply of moisture for the atmosphere. Moisture in the atmosphere is fully as essential to plant welfare as that in the soil. Our atmosphere is very dry, especially during the average summer. Even heavy dews assist materially sometimes in saving a crop, when they come during such a period. Not only does the vicinity of streams and lakes feel this influence, but vapor rising from such bodies of water is beneficial to all the territory. The amount may not always be great, but where we so easily reach a danger line even that little may be of great value. We should not cut down the possible source of supply of moisture to the atmosphere by draining our lakes. The drainage of our lakes should not be considered from the standpoint of the engineering possibility in any particular case. This is not primarily an engineering problem, but one which has to do with atmospheric moisture, and its solution should not be left to the engineer. It is sometimes urged that certain lakes have become foul, and hence should be drained. Usually this is the result of permitting cattle to enter the waters. Nothing is so fatal to plant life in water as stock. Plants die quickly where stock wades

about, and the waters are soon befouled. The vegetation does not make such places foul. Where green plants grow freely in water there the water is pure, for the green plants themselves purify it not only by absorbing materials which would pollute the water, but by setting free oxygen which also disposes of undesirable materials. When finally late in the season they die and are left stranded by the falling of the water surface, they decay so quickly that no evil results follow, there being only a little fertile material left for the next crop of plants. The foulest bodies of water are those to which stock has free access, and in which the green vegetation is soon destroyed. Yet we permit stock to enter freely such bodies of water as Spirit lake, the Okoboji lake, Storm lake, Clear lake and others, notwithstanding the fact that the water of the lakes is often used for domestic purposes, as is the case in Milford for example, and the further fact that thousands of people bathe in these waters during each summer season when the danger is greatest! Surely those who are responsible for this should not be permitted to use the resulting condition as a pretext or excuse for draining the impure lakes which result from this practice. The lakes may easily be kept pure, and this chiefly by keeping out stock.

There is still another reason for conserving portions of our state. This may not appeal to a large number of people, but it is important nevertheless. There is need of saving a part of our native vegetation under original conditions for scientific purposes and studies, not merely that the student may find plants for study, but that investigations of our native flora may be continued with a view of determining the influence of various conditions upon plant life. The native flora presents many advantages for this purpose, for it represents the final outcome of all the influences which have acted upon plants in time past; and it offers a much better measure of the value of these influences than could any artificially introduced and cultivated plant. The results so obtained are of value in their application to the control of cultivated plants, but the results themselves can be more readily and satisfactorily obtained by the study of native plants. For these purposes and for the benefit of the students yet to come the tracts conserved for the other purposes mentioned would serve very well and their desirability simply adds another argument to those which may be offered in favor of the establishment of such reservations. Our children should have an opportunity to see at least suggestions of what the state once was.

In the line of positive suggestions towards the carrying out of a plan for the conservation of natural tracts and conditions the following possibilities are presented:

1. So far as possible preserve the tracts (especially where forested) which border streams and lakes and use them also as game preserves. They may likewise serve locally as parks and local support could probably be secured if they were so used.

2. On the hills bordering the Missouri valley there are still tracts of almost undisturbed prairie. Much of that land is not of great agricultural value. Some of these tracts should be preserved that future generations might have an opportunity to study and enjoy the original prairie.

3. None of our lakes should be drained and even the few remaining swamps should be considered from other viewpoints than that which takes into account only the possibility of drainage.—Iowa Conservation. Vol. 1, No. 3, p 52.

FOREST AND GAME PRESERVES IN IOWA.

By C. F. Curtiss, B. Sc., D. S.

We have in Iowa no extensive native forest, yet we are much interested in preserving what forests we have and in promoting further forest planting. One of the best means of increasing the attractiveness of the farm home is by preserving and increasing tree growth. The Lincoln and Jefferson highways traversing the state will carry many transcontinental tourists. It will be greatly to the advantage of Iowa to make these highways attractive by tree planting. Then we should have several large tracts set aside and preserved as state parks, and serving the purpose of fish and game and forest reserves. We have in Iowa some tracts admirably adapted to this purpose, already well wooded and watered. A large fund paid in the form of hunters' and fishers' licenses has already accumulated. This fund now amounts to something like \$150,000. It would seem logical and proper to use this fund for the promotion of the fish and game and forestry interests of the state. The men who pay this fund into the treasury now get but little in return. With several large parks set aside and stocked with fish and game and the trees preserved and supplemented by additional planting and properly guarded by the state policy, we would develop places that would conserve fish and game and forestry resources and make Iowa one of the most attractive places on the transcontinental highways between the Atlantic and the Pacific oceans. The tourist travel will be more largely over these highways in the future and a system of state parks and adornment of the main lines of travel may be made an asset of great value to the state.

It is time to do some constructive work along this line, and so fortunately we have a means of doing it without additional taxation or burdens upon anyone.—Iowa Forestry and Conservation Association. Report 1914-15, pp. 109-10.

WOMEN WANT IOWA SCENERY PRESERVED.

By Mrs. May H. McNider.

Conservation of scenery is a live topic in Iowa today and it is our hope that the good work will go on not only until the proposed park on the banks of the Mississippi at McGregor is a reality, and the preservation of the other notable beauty spots of the state is assured but until there is an adequate recreation park of natural beauty in every locality. Our plans are directed to this end.

We who are so fortunate as to have our homes in beautiful, fertile, prosperous Iowa, progressive in many ways, have lagged far behind other states in appreciation and care of our scenic beauties. Having also failed to provide for the wholesome outdoor amusements and recreation so necessary to the continued happiness and well being of any people, we are already suffering because of our neglect.

The obligation to change this short sighted and narrow policy rests with those who have had a broader vision and have come to realize the gravity of the situation. Fortunately this number is rapidly increasing.

The Greater Iowa Association, by its enthusiastic espousal of the cause has given a wonderful impetus to the work in hand and much may be expected from this influence in the future.

Our clubwomen are showing great enthusiasm and readiness to work for the success of our national park project which is naturally of the greatest interest at the present time, though a study of conservation is developing a new feeling of responsibility for the protection of all our natural resources and beauties.

Everywhere there is evidence of an awakening and we confidently expect that all organizations and individuals having the welfare of our beloved state at heart will rally to the support of this movement for a more beautiful Iowa and a happier and more contented people.

Viscount James Bryce, formerly British ambassador to the United States, was a lover of nature and a believer in its preservation. He delivered an address before the American Civic Association concerning national parks as to the need of the future. In that address, Mr. Bryce expressed fully and clearly many of the ideals cherished by the women of Iowa, who are striving toward the preservation of Iowa's scenic beauty.

"There is only one thing better even than the city beautiful," said Mr. Bryce, "and that is the country beautiful.

"I have had a great deal of experience in England in dealing with these questions; for some years I was chairman, and afterwards a member, of a society for preserving commons and open spaces and public rights of way, and member of another society for securing to the public places of national and historic interest, and in the course of such membership I have been led often to think of what is our duty to the future, and of the benefits which the preservation of places of natural beauty may confer on the community. That is a problem which presents itself, not only in Great Britain, but all over Europe, and what Europe is now is that toward which you in America are tending. Europe is a populous, overcrowded continent; you will some day be a populous and ultimately perhaps even a crowded continent, and it is well to take a thought at once, before the overcrowding comes on, as to how you will deal with the difficulties which we have had to deal with in Europe, so that you may learn as much as possible from our experience, and not find too late that the beauty and solitude of nature have been snatched from you by private individuals.

"I need not descant upon that which the love of nature is and ought to be to each and all of us. The love of nature is the very simplest and best of those pleasures the power of enjoying which has been implanted in us. It is the most easily accessible of pleasures, one which can never

be perverted, and one of which (as the old ducky said about the water-melon) you cannot have too much. It is a pleasure which lasts from youth to age. Therefore there is nothing which in the interest of pure enjoyment we ought more to desire and study to diffuse than the beauties of nature.

"Fortunately, the love of nature is increasing among us. It is one of the tests of civilization that people should enjoy this simple pleasure instead of those more violent and exciting pleasures which may become the source, in extreme forms, of evil. The love of nature, I say, is happily increasing among us, and it therefore becomes all the more important to find means for safeguarding nature. The population is increasing, too, and the number of people who desire to enjoy nature, therefore, is growing larger both absolutely and in proportion.

"But, unfortunately, the opportunities for enjoying it, except as regards easier locomotion, are not increasing. The world is circumscribed. The surface of this little earth of ours is limited, and we cannot add to it. When a man finds his house is too small, he builds more rooms on to it, but we cannot add to our world; we did not make it, it was made for us, and we cannot increase its dimensions. All we can do is turn it to the best possible account. Now, let us remember that the quantity of natural beauty in the world, the number of spots calculated to give enjoyment in the highest form, are limited, and are being constantly encroached upon.

"There are four forms that this encroachment takes. There is the desire of private persons to appropriate beautiful scenery to themselves, by enclosing it in private grounds around their houses and debarring the public from access to it. We in England and Scotland have lost some of the most beautiful scenery we possess because it has been taken into private estates.

"Then the enjoyment of natural beauty is largely encroached upon by the operations of lumbermen. I do not blame them; timber is wanted and they want to drive their trade but the process goes on too fast and much of the charm of nature is lost, while the interests of the future are forgotten.

"And lastly there is the question of water power. Fortunately you have a great supply of splendid water power. I am far from saying that a great deal of it, perhaps most of it, may not be very properly used for industrial purposes, but I do say that it has been used in some places to the detriment and even the ruin of scenery. It has been used in Niagara for instance to such an extent as to change completely the character of what was once the most beautiful waterfall landscape in the whole world.

"Taking all these causes together, you can see how many encroachments there are upon the unique beauty of your country; and I beg you to consider that, although your country is vast and has scope of natural beauty far greater than we can boast in little countries like England or Scotland, even your scenery is not inexhaustible, and with your great population and the growing desire to enjoy the beauties of nature, you have not any more than you need. Fortunately, you have made a good

beginning in the work of conservation. You have led the world in the creation of national parks.

"Now, a word about additional parks. Although you have done splendidly in creating some, there are still other places where national parks are wanted. If the automobilist wants to be whirled along the roads, let him have his way, but keep wide sylvan spaces where those who seek quiet and the sense of communing with nature can go out in the early morning from the city and spend a whole day enjoying one spot after another where nature has provided her simple joys, mingled shade and sunshine, the rustling of the leaves, and the songs of birds. Such things in life the man of the cities can have, and when nature has provided it in such bountiful measure would it not be a shame to lose the benefits she offers?

"I am sensible that I may be perhaps accused of treating this subject in a somewhat sentimental way. Well, I confess, I am not addressing my arguments to those who think that man lives by bread alone, or who thinks there are no values except those measured by dollars and cents. It is because I believe the members of this association are not of that mind that I venture to address these considerations to you.

"And let me try to give some logical quality to my statements by submitting some few propositions in order.

"The world seems likely to last a long, long time, and we ought to make provision for the future.

"The population of the world goes on constantly increasing and nowhere increasing so fast as in North America.

"A taste for natural beauty is increasing, and, as we hope, will go on increasing.

"The places of scenic beauty do not increase, but, on the contrary, are in danger of being reduced in number and diminished in quantity, and the danger is always increasing with the accumulation of wealth, owing to the desire of private persons to appropriate these places. There is no better service we can render to the masses of the people than to set about and preserve for them wide spaces of fine scenery for their delight.

"From these propositions I draw the conclusion that it is necessary to save what we have got, and to extend the policy which you have wisely adopted, by acquiring and preserving still further areas for the perpetual enjoyment of the people.

"Let us think of the future. We are trustees of the future. We are not here for ourselves alone. All these gifts were not given to us to be used by one generation, or with the thought of one generation only before our minds. We are the heirs of those who have gone before, and charged with the duty we owe to those who come after, and there is no duty which seems clearer than that of handing on to them undiminished facilities for the enjoyment of some of the best gifts that the creator has bestowed upon his children."

The Iowa Federation of Women's Clubs has a special division on natural scenery, of which Mrs. Charles H. McNider, of Mason City, is chairman. The committee is made up of the following: Mrs. Joseph M. Casey, Ft. Madison; Miss Lena Roach, Rock Rapids; Miss Lesley B.

Artis, De Witt; Mrs. Bernice Lacey Sawyer, Oskaloosa; Mrs. Burt J. Thompson, Forest City; Mrs. A. W. Murphy, Shenandoah; Mrs. Leonard Everett, Council Bluffs; Mrs. J. C. Jackson, Iowa Falls; Mrs. John Mulhall, Sioux City; Mrs. J. L. Etzel, Clear Lake.—Iowa Magazine, Jan., 1917, pp. 15-16 and 42.

CONSERVATION OF PRAIRIE

By Ada Hayden.

Iowa is said to be a prairie state, but what is a prairie to the present generation? Within 40 or 50 years, the broad stretches of tall shining grass trembling in the sunlight or tossed by the breezes into billowy waves, gorgeous as the season progresses with its pageant of brilliant hued flowers. A flint now and then picked up from a gravelly knoll recalls the feathered, moccasined, swift footed dweller of the plains. But he has passed on to happier hunting grounds and the prairie too is fast passing.

The goddess of agriculture has banished the prairie and over it spread green fields of shimmering, rustling, yellow tasseled corn, acres of tawny oat shocks, and ragweed covered pastures. The buffalo which sniffed the prairie fire and raced madly to shelter from this red tongued fury is now succeeded by the cow, a dweller of the resplendent red and white striped barn. A network of highways corrals the once wild expanse and down the dusty way throbs the busy beetle-like car.

Few but the farm boy and the meadow lark know where the swamp now lingers, where the marigolds glitter in the marsh, where the red brown knoll, fanned by the winds of March, turn pale lavender as the pasque flower wakes in the spring. Then as the splashing drops of April have carried the fragrance of these March flowers far, the grassy slope as a magic carpet is blue with violets. With June, the scarlet lily as torches, light the slope. The blazing star marks the zenith of July, and sunflowers and golden rod herald the climax of the summer, and the azure gentian, like pools of sky dropped down, bask in the warm October haze. So passes the panorama.

Now comes the plowman, and these little communistic bits of beauty, the handiwork of a thousand years, which no man has yet created, is folded away, to return only as corn and dollars.

True it is, the people of the country-side have increased their wealth and commodities through the produce of the soil and their prosperity stimulates the pulse of industry. That there is a necessity for the increase of food and fiber products is evident. Tillable land we already have, but labor we have not, adequate for the proper care of already broken land.

The activities of life have increased in complexity and responsibility, hence the greater the intensity of life, the greater is the need of inspirational forces. An isolated patch of New England daisies along an Iowa railroad right of way, drew throughout its flowering period a throng of admirers from the town. Strangers unacquainted with the prairie

come to explore these fascinating relics of the past. Scientists travel long distances to study it. Greenhouses capture some of these plants from the wild, transplant such as will endure, into captivity. The metropolitan, who lived in the old homestead, wanders back again to the haunts of the meadow lark to renew the images gathered in his youth, only to find the source transformed into hogs and corn.

Shall this bit of Eden be preserved only in literature? Most men after they have succeeded in the elimination of natural beauty seek to re-instate it in some form of planting from the nursery. But what florist with all his skill can create or maintain such a panoramic bit of loveliness? Beauty is constantly sought, though the inaccessible seems to greatly enhance the pursuit.

The prairie flora is an inspiration to men and most prized when gone forever. Savage tribes hand down legendary narrations of their environment and customs. Should not we do more than incorporate these natural gardens into literature and legend? Preservation of a few acres in each county could be accomplished without encroaching upon economic products and secure to the present and to the coming generations a heritage from which no individuals are justified in depriving them. Such reservation of prairie if made near the larger schools would be useful for study. Wherever located they would be available to the auto traveler. Other areas which do not conflict with private estates are the railroad rights of way. Railroads spend thousands of dollars in making beautiful parks at their stations, but what park planting can equal a mile or two of flaming Turk's cap lily which frequents the damp native prairie in July, or the white beds of nodding anemones, the red and white sweet william, the purple patches of gauzy spiderwort, the gorgeous butterfly weed, the glowing goldenrod, and the banks of stately, radiant sunflower. All these plants are carefully cultivated by florists in parts of the country where they are not native. Why not preserve now at a small cost what can not be replaced at any cost?

ACTION ON STATE PARKS BY THIRTY-SEVENTH G. A.

By B. J. Horchem, State Senator.

Although the Iowa Forestry and Conservation Association did not realize its full recommendations as outlined at a special meeting held at the opening of the last session of the general assembly, the passage of the act, providing for the establishment of state parks, is one whose value the entire population of Iowa will appreciate and will be more and more proud of as the years go by. Much credit is due to the untiring efforts of such far-seeing and public spirited men like Senator Chase and Senator Holdoegel.

It will be noticed that through this act Iowa can secure public reservation in three ways:

(1) The fish and game warden, by and with the consent of the executive council, can establish public parks in any county. By appropriating \$50,-

000 out of the fish and game protective fund, the executive council shall have power to purchase or condemn land for such purpose and to purchase and condemn land for roads leading to such parks.

(2) The executive council is empowered and authorized on behalf of the state to receive donations of land for either park or highway purposes.

(3) The state treasurer shall have authority to receive and accept, on behalf of the state, donations (cash) for either purpose. The donor may specify the place and the purpose for which the donation is to be received, used and expended, and that it shall not be used for any other purpose. Every park has a definite purpose to serve and should therefore have definite requirement.

We have the start at least to acquire and to hold for the benefit of all the people—both the present and future generations—and our influence should be exerted so that it will become wide-spreading and far-reaching so that anyone having in mind a beauty spot, a forest, a lake, or any place which may prove valuable as a future possession to the state may realize that it can be donated or that it can be bought and donated to the state. That such place will then belong to the people and that it will be held in trust by the state for its people. What grand monuments can be established for those who were near and dear! What possibilities to check any further action that would impair the beauty of such places!

Our immediate duty is to see that we secure the appointment of three good members for the board of conservation, who, with the curator of the historical department, shall investigate places in Iowa, valuable as objects of natural history, forest reserve, as archaeology and geology, and for considering the means of promoting forestry and maintaining and preserving the animal and bird life in this state and for furnishing such information to the executive council of the natural resources of the state, so that the recommendations can be printed and furnished to the members of the next general assembly; also to get its people to consider their natural possessions, and to authorize the board of conservation as soon as may be, the refusal of the most attractive reservations.

A little can be done here, a little there and a little somewhere else, and all gather together in a great current of public influence so that when the state becomes inhabited to its full capacity it can boast of plenty of available land for public purposes, and that it belongs to all the people.

Efforts should be made to acquire in its various parts a number of parks which will be perpetually the breathing grounds to be freely and fully used by all the people of the state. Let us arouse to the needs which parks and people's playgrounds represent in the people's life.

The Iowa Forestry and Conservation Association has shown a splendor of vision and a quality of power and speed that proved beyond expectation during the last year. This was a most valuable constructive piece of legislation, for in a short time likely the children of the city will find in the woods and the public parks, the only opportunity within reasonable distance of their homes to enjoy the beauty and restfulness of the forest, the lake, and other peculiar beauty spots and which should therefore be permanent means of wholesome public enjoyment.

Let the good work go on.

PARKS IN CONNECTION WITH STATE HIGHWAYS.

By L. H. Pammel, Botanist.

It is generally conceded by everyone that the American people, as a nation, should give more attention to the subject of recreation. With an ever increasing population, the demand for recreation will become greater. It is an important question how to reach the great body of our people. It occurs to me that we have a rare opportunity to make use of the state highways by producing small park areas at convenient distances. Dr. Macbride said somewhere, "The absolute need of the milder healing influence of natural beauty to our eager, anxious, overworked, care-burdened, gain-seeking, I have elsewhere found occasion to discuss."

It is a fact that no other state in the Union, perhaps, has so large a per cent of its area under cultivation as the state of Iowa. This means that little land is left with free access for the people which can be used for recreation purposes. The user of the public highway is quite familiar with the many signs which read, "Keep out of these premises," or "No trespassing allowed." These signs admonish him that the grounds are not for public use. There is good reason why the farmer or the owner of a piece of woodland should object to having his land used for public purposes. It is aggravating to say the least, that private ownership is often not respected. It often happens that the man or woman who makes use of woodland grounds is careless about closing the gates. They often break the wires of the fence and scatter paper and other litter over the grounds, thus causing damage and annoyance to the owner. We all recognize that owing to the automobile, travel on the highway has increased many times. The highway in modern times is fast assuming the same importance to the community that it did in the settled countries of Europe before the introduction of the railway. In another decade the use of the public highway by automobiles will be doubled and probably trebled. The automobile is the means of bringing the people from the different scattered communities together. Good highways, more than ever, will be used for the pleasure a person will find by travel on a given highway. The amount will depend on the character of the highway itself, the beauty of plants, the hillside bedecked with sweet william, rose, aster, goldenrod and sunflower, as well as the ornamental shrubs and timber.

The man who wants an outing on Sunday afternoon will enjoy taking his family to picnic somewhere in the woods. He will not select the dusty roadside, but a nice, clean, comfortable place where the tablecloth can be spread on the green sward of grass. Where can he now get this in Iowa, except as he gets permission from the owner of the woods? Sometimes this permission is given and sometimes it is not.

My argument, then, is this, that the state should own a small tract of woodland in every county in the state, along the main state highways running north and south and east and west. This land need not be the most expensive in the county. The rough land where little valleys and brooks occur is just as good and perhaps better than smooth, level, prairie land. It should have native timber and be sufficiently attractive for the family to really enjoy its beauty. The wild flowers should be permitted to grow in profusion. They add charm to the countryside in springtime, summer

and fall. The child will appreciate the beautiful and in old age will recall the pleasant memories of long ago. The area of land bought for each of these community parks need not contain more than twenty or twenty-five acres.

The county park idea was advocated by Professor T. H. Macbride in 1896, in these words: "All of us in one way or another know something of the monotonous grind which makes up the lifelong experience of by far the larger number of our fellowmen. On the farm, in the shop, in the mine, day after day, one unceasing round of toil, into which the idea of pleasure or freshness never enters. How many thousands of our fellowmen, tens of thousands of our women, see nothing but the revolving steps of labor's treadmill, day in, day out, winter and summer, year after year, for the whole span of mortal life? This is especially so here, in these western states, where the highest ideal is industry, the highest accomplishment is speed. Our rural population is wearing itself out in an effort to wear out 'labor-saving machinery.'"

"A county park well kept and cared for would be a perpetual object lesson to the whole community, would show how the rocky knoll or deep ravine on one's own eighty-acre farm, might be made attractive, until presently, instead of the angular maple groves with which our esthetic sense now vainly seeks appeasement, we should have a country rich in groves conformable to nature's rules of landscape gardening if not to nature's planting."

Later, in 1915, Prof. M. F. Arey said: "In a rich and progressive state like Iowa, there ought to be found a way of combining with suitable modifications, the best features and characteristics of both the city and national parks. How can this better be done than by means of the country parks? In the average city park, useful as it may be, there is not enough of nature at her best to gratify the inherent longings of men, women and children for change, rest, something that attracts, cheers, uplifts, if only for a few hours. Multitudes have neither the time nor the means to go to the country, to the mountains, the forests, or the seashore. They can take a day off for a family, neighborhood, township or country picnic; for a club meeting, rally, or convention and be the better for it. There is too little of social intercourse measurably freed from formality and the conventional, a kind of sociability that ministers often to the completest refreshment and inspiration."

These parks necessarily will have to be located with reference to permanent roads, and in time each park will have a lodge. The lodge should have some comforts and accommodations for the public. There should also be a keeper whose duty it would be to look after the upkeep of the park. Sites should be selected with a spring of running water. If this cannot be had then a good, deep well should be provided. If possible, of course, some arrangement should be made for the keeper of the lodge, with the highway commission, to patrol the highway.

COUNTY PARKS AND FORESTS.

By Elmer Reeves.

A few years ago such a thing as a county park would hardly have been thought of and would not have been advisable, but with the present methods of travel over the country roads such a thing seems not only practical but a very desirable thing. In a county of average size the opposite corners are but forty-eight miles apart and a park at all centrally located would be only an hour's drive from almost any part of the county. This would permit the people of the whole county to gather for conventions, picnics, and other meetings of general interest. A community interest could be developed to which Iowa has so far been a stranger. We hear of large gatherings of Iowa people in other places and why not have these at home. The county park would serve to arouse an interest and get them started, and if large meetings of a general interest are once established they would be popular enough to become permanent. Each city has its park and even the village aspires to the ownership of a piece of ground they designate as a park. These are often sadly neglected spots and of but little use and too small to serve the need of a county gathering or the other uses to which a real park may be put. I would picture a county park as a place large enough not only for public gatherings, but, as my subject suggests, a forest as well—a place where all the native trees are allowed to flourish and all the plants that grew in pioneer times are encouraged to multiply.

There was a wealth of native plants in the woods of pioneer times and while many sorts are no longer seen, they would largely reappear if given the chance. There were the little creeping things that grew in low dark places and gave a succession of bloom from earliest warm days of spring, the upland flowers of brighter and more showy appearance, and innumerable plants of interesting growth and habits, among which the lover of nature could spend days of delight. In the openings were the sunflowers, goldenrod, asters, and many other attractive plants that many class as weeds but which are being sought by landscape decorators. There were the bramble patches where the red and black raspberries ran riot and the wild blackberry gave more luscious fruit than is usually grown in our gardens. Elderberries showed a wealth of bloom in early summer and, later in the season, their no less attractive pannicles of black fruit, which formed the foundation for the pies of our boyhood days, were fully appreciated. There were thickets of plum where the bloom resembled a bank of snow and, later, the loads of fruit, of variable quality, but much of which was equal to any grown in our orchards of the present time. The thickets of wild crabapple when in bloom gave a profusion of beauty and a fragrance that could not be matched in any climate.

There were the sumacs, tall growing and coarse shrubs, but which are now catalogued as choice ornamentals in foreign countries; the wealth of roses, some of low growth and others climbing high and covered with masses of bloom as beautiful as any of the double beauties of our gardens and of a fragrance to which the latter are strangers. Most of the roses bloomed in June but some continued through the summer, so in this there is nothing new under the sun.

Then you remember the great patches of hazel where loads of nuts could be gathered each fall; the hickory, walnut, and butternut trees loaded with their stores for winter use.

These are but a few of the many things found in profusion in the native forests. In the bits of forest that commercialism has left us we can see but a hint of the original beauty of these places. Why not restore some of this native beauty so that there will be one place in each county at least where daily cares may be forgotten and the beauties of nature enjoyed by all?

Varying conditions will be found in the different counties but I am sure that some tract could be found in each county, centrally located, that, if secured by the public and properly looked after, would be a source of enjoyment and pride to every citizen. In Bremer county there is a tract located to the southeast of Waverly and reaching to the town of Denver, which would make an ideal county park or forest reserve. Some ten to fifteen sections of land could be included in this reserve. A small part could be secured to start with and this added to as circumstances would warrant. This tract was originally in timber and was known as the "big woods." It is hilly ground and watered by several streams, making as beautiful place for an afternoon drive or for wandering through patches of woods that still remain, as there is left in Iowa. This was bought mostly by farmers living a few miles away and owned in five and ten acre tracts and held as wood lots to supply fuel. Later, as the trees became scarce, these tracts were bought up and an attempt at farming made upon the clay hill sides and among the stumps. As a rule not much of a success has resulted. Bordering this tract is a stretch of gently rolling prairie land where the finest farms are to be found. The farm houses are modern—many being supplied with gas or electric lights, while immense barns, silos, and droves of contented farm animals are in evidence.

On the clay hills in the "big woods" region the contrast is plain. Some farmers have struggled on to a degree of success but the results of a majority of residents show the land to be poorly adapted to general farming and better suited to the growing of forest trees. I might describe some of the places to be seen on the hillsides but you would hardly credit the facts. You would certainly think I was describing something outside of Iowa and entirely foreign to Bremer county. A man riding through this tract once turned and asked, apparently in all candor, "when did we cross into Missouri?" For this I must beg the pardon of our neighbors to the south and go on with my story.

Suppose this tract was secured as a forest reserve. Owners would be paid for their holdings and competent men placed in charge to protect the trees now growing and plant the barren places. Quantities of acorns, walnuts, butternuts, etc., could be planted each fall. Seeds of elm, ash, maple, and other trees could be scattered in season and the whole soon covered with a vigorous growth. Shrubs and wild flowers would reappear and we would again behold the beauty of nature. Present roads could be maintained and the public invited to look and enjoy. Hunting and fishing could be under proper restrictions and pavilions provided for

shelter and use of picnic parties. Pasturing in this tract would be prohibited and a rich heritage passed to future generations.

This may all seem like a wild dream but it is entirely practical. The expense could be easily borne by a general tax and when fairly started the income from sale of matured trees would pay more than cost of maintaining. Northeast Iowa is to have a forest reserve park. This has been held in reserve for years through private interest and why should not all parts of the state share in a like enterprise? This is still a new and pioneer country and very much undeveloped. Hunters and the public have been allowed to roam over private property at will but this cannot always be and if people are to have a place for recreation it must be provided through public enterprises. The sooner this is done the better, as delays will cost in money and loss of material. The legislature can make provision for this the same as they did for a soldiers' memorial, and each county be allowed to start when ready. There is nothing more attractive than a well kept farm, but not all our land and attention should be given to the purely commercial side of our natures. Recreation is needed by all and the kind this would provide would be better than any other that can be devised. Let us have a forest reserve park in every county of the state and begin at once on a scale that would be a credit to the country.—Iowa Forestry and Conservation Association Report 1914-15, pp. 143-7.

COUNTY PARKS.

By Melvin F. Arey, Geologist.

The term "park" as popularly used has reference to tracts of land of varying extent set apart for public resorts, for recreative and other purposes. Great landed estates in Europe have had their parks for centuries but the people had no access to them. Free public parks are of comparatively recent origin. Few city parks in this country date back a hundred years, yet within the last fifty years they have met with such favor and appreciation that there is scarcely a city or village of any pretensions in the whole wide land that does not have something answering the idea of a park, though in too many instances the true purpose of the park has been perverted. In the main, parks in this country are represented by city parks which are intended to serve local interests only or by national parks which are few in number and which, because of their location, are accessible to relatively few people. Manifestly the gap between these is too great to meet the urgencies of the people both of the town and country. It was with this in view that Mr. Foster, a few years ago, set forth in a paper before this association the claims of township parks. The grounds presented for the establishment of such parks were sound and sufficient to warrant at least the experiment, in a few instances, but somehow there has been little, if any, response anywhere in the state.

In a rich and progressive state like Iowa there ought to be found a way of combining, with suitable modifications, the best features and characteristics of both the city and national parks. How can this better be done

than by means of the county parks? In the average city park, useful as it may be, there is not enough of nature at her best to gratify the inherent longings of men, women and children for change, rest, something that attracts, cheers, uplifts—if only for a few hours. Multitudes have neither the time nor the means to go to the country, to the mountains, the forests, or the seashore. They can take a day off for a family, neighborhood, township or county picnic; for a club meeting, rally, or convention and be the better for it. There is too little of social intercourse measurably freed from formality and the conventional—a kind of sociability that ministers often to the completest refreshment and inspiration.

The county park should be of ample extent. Any county can well afford at least a section of land for such a purpose. More would be better—and better in a sort of geometric ratio. Its location should be determined not by the mere convenience of any locality or localities. Other things being equal, the more nearly central it is the better, of course, but sacrifice of genuine park attributes for the sake of saving a few miles to some portion of the people would be fatal to the very end for which it exists. The extent of the average Iowa county is not so great as to make inaccessible any portion of it from all other portions in these days of railroads, interurban trains, and automobiles. Varied and unusual topography along or including a stream or pond of water is of almost vital importance in a park of this kind. I only say “almost” because I am aware that such conditions do not exist in any striking degree in some Iowa counties, and yet they ought to have their parks emphasizing such favorable conditions as they do have to the fullest extent. Level stretches along the water side, rugged slopes gashed with ravines and ample upland areas should be found in the county parks if possible, to give variety of sight and soil for trees, shrubs and flowers. Wooded areas with occasional open spaces for play grounds, for an athletic field, or merely for beauty and variety should prevail. Drives and pathways, only sufficient to make all parts reasonably accessible, should be provided. Here and there a tree that promises in the years to come to reach majestic proportions or to present in an unusual degree the typical characteristics of the species to which it belongs, should be favored with room for unrestricted development, for in these days it is all too rare to see a tree at its best—and a tree at its best is as inspiring and impressive as a mountain or the ocean.

The park as a whole, or at least some part of it, should serve as an arboretum in which every specie of tree, vine, and shrub that will grow in such conditions as the park affords, should be found ultimately. Wild flowers of all kinds should be encouraged. In places nature should be allowed to run riot. Elsewhere there should be some thinning and trimming that there may be open woods as well as thickets, giving opportunity for the breezes to enter and the sunshine to filter through, thus favoring those plants to which both sun and shade are welcome.

Vistas should be opened up and every device for giving variety and interest should be adopted in places, as opportunity may suggest, but care will need to be taken that these devices do not develop into pronounced and offensive artificiality. Naturally such a place would be the ready resort of birds and interesting animals in great numbers and variety, pro-

vided provision be made for their safety and freedom from molestation, thus increasing, manifoldly, the attractions of the park.

I have said nothing of the educational value of the county park, but it can readily be seen that no one could visit such a place without something new and interesting being presented to his attention. To the young it would be an inspiration and incitement to become better acquainted with all that offers itself that is new and striking. The teachers of botany, zoology, and nature study, in both town and country schools, would here find unusual and charming opportunities to illustrate their work and to stimulate their pupils to new efforts.

The principles of forestry would here find exemplification. Portions of the park should be treated with this specially in view. It would be just the place for lectures on the subject and for developing some of its practical phases.

In fact a county park would in one way and another benefit every individual of the county if he would have it so, and I am not sure but that it would do so anyway. Unlike a public building or monument, a public park of the kind I have so briefly and imperfectly brought to your attention would never be at its best in your lifetime but its value would increase with the years. Improvements must be made from time to time. It would itself suggest some of these improvements with the changes that naturally take place. Men would discover new features that might be added as they study the subject and they would study the subject as appreciation of its importance develops.

A word should be said as to the administration of such parks. It may be that legislation will be needed before county parks can be established and administered. However, that may be, there will be found a necessity for rules and regulations in order that flowers, shrubs, trees, and birds may not be disturbed unduly. It is unfortunate that civilization has not yet reached the stage where carelessness, self seeking, and mischief making for mischief's sake are not found in all too many individuals. A county park without restrictions and oversight would afford all such an opportunity to make the county park a mere waste place with nothing to recommend it above the neighboring pasture or woodlot.--Iowa Forestry and Conservation Association Report 1914-15, pp. 138-142.

COMMUNITY CENTER ENTERPRISES IN RELATION TO STATE PARKS.

By R. J. Pearse.

Community enterprises are the basis of the social life of the Iowa farm home; without them farm life reverts to the individual "catch who, or catch as catch can," methods of existence; with them the entire farming population of the community is molded into a unit for the definite benefit of the community as a whole and not for any individual person or persons.

Community property develops and increases very slowly: First, because of the proportionally small number of people who live in a farming community in relation to the number who live on the same area in the city; second, lack of decision as to what form of community activity is of the most benefit; third, lack of appreciation on the part of some "chronic kickers" of the value to the community of such public enterprises, and fourth and possibly the most important, lack of grounds for community enterprises development.

With this idea in mind it is not hard to understand that with the small number of interested members in a community, the initial cost of sufficient land, erection of community buildings, development for park and athletic purposes, permanent upkeep and police supervision, such a program is practically prohibitive even if apportioned equally among the property owners and interested public spirited members of the community.

The definite community center enterprises already existing in Iowa have been developed through the philanthropic endeavors of some public spirited citizen of these communities or some one vitally interested in the development of the same. On the other hand those communities without such a public spirited citizen are technically speaking "out of luck," although they may be even more deserving than those already receiving these privileges.

In a great many cases community organizations are capable of and are willing to create among themselves a fund sufficient to erect a community building suitable for library, indoor athletics, public meetings and general community purposes but are unable to create or subscribe sufficient funds for the buying of land, the development of the grounds and the cost of upkeep and police supervision.

Our sparsely populated farming communities make this situation inevitable and for the most part prohibitive for the ordinary farm community, without state aid.

It has been proposed that a system of parks be developed throughout the state; state owned, state organized, and state controlled to be used especially for the benefit of the people of Iowa and the large number of tourists which pass through the state each year. It has also been proposed to establish definite park sites along the main traveled highways of the state in order that they may be used for recreational purposes of camp sites, picnic grounds and reservations of native beauty and scenery.

We propose that these park sites be established for another reason, that of furnishing grounds, development, upkeep and police supervision for community center enterprises where the community organizations will co-operate with the state authorities to place suitable buildings for community purposes and state recreational advantages.

If it were possible for county communities to furnish the entire amount of funds to build such a community center would it be right and just for them to furnish these funds while their city friends drive out and enjoy the picnics, park, camping and possibly athletic privileges without paying their portion of the initial cost and upkeep? Under state ownership this situation would not arise and everyone would be placed on the same basis.

The city man is not over anxious to have the farmers use his privileges without paying for them in theatre, fair, carnival and amusement park tickets. On the other hand unless the farmer is willing to open his choice wood pasture and water sites for public use he is considered a grouch, a tightwad or public nuisance. Is the private property in the city open for the countryman's use? Why should it be in the country?

Natural, attractive and wholesome country parks owned and controlled by the state and made more useful with the addition of community buildings built with community funds, would be one of the most valuable assets that could be granted to develop community spirit among Iowa's farming population.

With such a system of Iowa's country parks, inter-city traffic will constitute which constitutes 47% of our highway traffic would be greatly assisted and would appreciate these sites for camp and rest room privileges. City population who have the necessary means of transportation would feel free to use these country parks in many ways. The average American citizen has a keen appreciation of the property rights of others and for this reason does not go to the country to enjoy its privileges except as he makes a continuous trip. Trespassing does not appeal to him and so he does not get acquainted with the country as he should.

A well developed system of country roadside parks improved, assisted and developed by community funds would be one of the best avertisements for the state as far as tourist traffic is concerned. Appropriate signs indicating direction and distance from camping sites, where rest rooms, camping sites, and picnic facilities are available, would be of infinite value to the tourist.

In conclusion a carefully selected system of state parks located along main traveled highways would be a definite means for the promotion of community enterprise in the country. With the co-operation of community organizations as far as the erection of buildings and the use of the grounds are concerned a community spirit is developed which cannot be estimated and it is invaluable in the building and future improvement of the community.

Such parks would furnish definite points of contact between the city man, his country brother and builds up for both of them a keener appreciation for the country and its possibilities and advantages.

For these reasons we cannot recommend too strongly a system of country state parks, some of them to be located along main highways for definite community enterprises, for town, country, and tourist recreation and enjoyment.

Dated January 31, 1919.

COUNTY PARKS AND FORESTS.

By T. R. Truax.

The subject of "County Parks and Forests" is rather a new one in this country. It is probably a natural outgrowth of the movement for a betterment of rural conditions in America. To some the idea of county parks

in Iowa may seem ahead of the game, inasmuch as neither a national nor state park is found within its borders. But they may be reminded of the fact that individual communities and counties are often ahead of the state in movements for better things.

The idea of county parks and county forests can well be discussed under the one subject, for in Iowa the rural park and forest will be much the same thing. Forests on a strictly commercial basis will never occupy large areas of our most valuable lands. When they are established solely with the idea of profits they will have an equally large value for recreation, game and wild plant preservation. So, necessarily, our forest areas will combine in most cases the economic phase with these others of equal importance. They are inseparable.

The need of parks and forests is evident and yet, in our mad rush for immediate wealth, is often disregarded. They have their place in all civilized countries today. In rural England, in France, and in Germany, they play a most important part in the life of the people. Our own national government, some of the states, and many cities have likewise felt their need. Today our national parks and forests are scarcely equalled in beauty and grandeur anywhere; many of the states have reserved or bought back state forests, and an awakened interest in city parks and forests is sweeping the country. But little has been done to preserve the natural beauty spots in the rural districts of states like Iowa. The best species of trees have been culled from the forests, the wild flowers have suffered from the changed environments and have been eaten and trampled by live stock, and the wild birds and game have been hunted and chased from the areas. Hardly an acre in its original beauty and naturalness remains. Commercialism has swallowed it up and with it all has come discontent and unrest among the rural people.

The "back to the farm" movement, embodying the improvement of country life and the community center ideas, all aim to instill contentment into the minds of the rural peoples. Would not the community park and forest play a large part in accomplishing this end? The national parks and forests, grand as they are, are seen by but few of our rural people. They are for the well-to-do people with the time to visit them in the warmer months. The average farmer's services are indispensable to his work at the season when a visit to such parks or forest is possible. State and municipal forests and parks are likewise not for him. It is little wonder then that he and his children weary of the steady unchanging grind. The sole accumulation of wealth cannot make a people contented. The fact that the census showed a decrease in population for Iowa from 1900 to 1910 certainly cannot be explained by the poorness of Iowa's soils. Whatever else may be attributed as causes, the longing to get away from the monotony of farm life—to see and to know the life of other parts—the mountains and the forests—has played its part.

As an illustration of the part that forests play in the life of a people, let us turn to the city forests in Germany.

In many cases not only is the forest the principal livelihood of the people but it supplies a large part or all of the local taxes. The city forest of Zurich in Switzerland, which has been managed scientifically for nearly a thousand years, is annually yielding a net income of \$7.29 per acre, while

the city forest of Forbach in Germany with a net profit of over \$12.00 per acre pays all the communal taxes. But more than that, the city forest is the playground of the people. The German is taught to love the forest. As a schoolboy he spends much of his time there. Likewise, mothers with children, factory workers, and shop girls, all find rest there on Sundays and holidays. For it is truly a place for rest with the cool, fresh air, the pure sparkling water, the flowers and the birds. But the instinct and the love of woodland and wild life is universal. Probably each one of us can think back to one or more pleasant days spent in the woods. It is truly a vacation. There is a place in the rural community for the park and forest for that majority of people who will never visit our state and national parks and forests.

Then, too, the county park or forest will play a most important part in the conservation of wild plants, birds, and game. Foremost among the reasons for the destruction and subsequent disappearance of our native plants is the clearing of woodlands, the grazing of live stock and the burning of slash and underbrush. The plant's environment is thus changed and it quickly perishes. The lovers of birds and the sportsmen also know the value of forests as bird and game sanctuaries. They are most important in increasing the scarce or almost extinct species.

Finally the establishment of county parks and forests will tend toward a proper utilization of all our lands. Iowa is, and always will be, essentially an agricultural state. But there are thousands of acres of land that can be bought at a price much less than what has been paid by cities in Europe for land for forestry purposes. If just 1% of the area of Iowa was used for forests and parks it would constitute an area of more than a third of a million acres or an average of 3,600 acres per county. Few, if any, counties there are that do not have that much land already forested or that much land of poor quality that could be planted to trees. The majority of counties have much more. Who can doubt that the remaining acres would not be more valuable for the presence of these wooded areas?

The false idea prevailing in some sections of the country that to be profitable the land must be cleared of forests and put to other purposes, is doing much mischief towards the proper use of our resources. The deception may prevail for a time as it did in eastern states, but sooner or later a proper balance will be reached.

Then there is another phase to the question. Iowa is located at a considerable distance from the great forest regions of the country and is a heavy consumer of wood. For these reasons the markets here will be of the best. We can, therefore, afford to use better lands than is used in other sections simply because of supply and demand of forest products. But the revenues derived from forests are by no means to be disregarded. Well managed forests in Europe are yielding as net profit \$5.00 to \$12.00 per acre per year. Forest plantations here in Iowa have given equally as large returns.

But, however profitable the growing of forests on long rotations, it is not a private proposition. It is essentially a business of a long-lived organization. Few individuals are willing, even though financially able, to invest today with the idea of harvesting fifty or one hundred years hence.

A few years ago the legislature of Iowa sought to encourage the practice of forestry among individuals by providing for the exemption of forest lands from taxation. Yet that law has failed to have an appreciable effect upon the care and management of our woodlands. Neither are individuals prone to look a generation or two ahead to the happiness and contentment of their posterity. For this reason forestry and parks are primarily a community, state, or national undertaking.

The question of acquiring and maintaining county parks and forests is too large to consider here. I will but suggest that the legislature should provide the counties with power to levy taxes for the purpose of acquiring and managing the same, as has already been done in other states. Also, the park and forest should find its place in the work of community organization. Let us supply as best we can those things which are drawing our people outside the state. Along with the consolidated school and community center idea, let us not forget the forest—the greatest play ground of all time, thereby maintaining a proper balance in the use of our lands and aiding in the preservation of our wild plants, birds, and game.—Iowa Forestry and Conservation Association, Report 1914-15, pp. 148-52.

PRESERVING THE INDIAN MOUNDS ALONG THE MISSISSIPPI RIVER.

By Ellison Orr.

Most of you have heard, or read, at some time or other of a mysterious race of people that lived and flourished in the valley of the Mississippi long prior to the coming of the white man, and that left over a territory large enough for nine or ten states, evidences of a considerable advance in civilization along certain lines over what it was believed people who were considered as savages were capable of making.

A vast amount of research work by archaeologists and others interested, has in a measure, dispelled the mystery which at one time surrounded the evidences of their occupancy, and it is now generally believed that such are only the work of the more or less remote ancestors of the American Indian.

With one exception, these people had not advanced beyond the stone age, that is, all weapons, implements, and ornaments, made by civilized man of metal of some kind, were by them made of bone and stone. The one exceptional use of metal was that of copper. A limited amount of this, in sheets and nuggets of pure metal was mined in the Lake Superior region and with stone hammers beaten into the desired forms.

Everywhere about the fields we pick up arrowheads, knives, and spearheads of flint, quartz, and other suitable rock material, some of them rough and imperfect, others finely wrought and beautifully symmetrical. It was once quite generally believed that the making of these was a lost art, but recently a member of the Wisconsin Archaeological Society has made some very fine ones, some of them from glass, by the chipping process. The secret appears to be the skillful hand.

Much less frequently found are the axes, celts, and mauls made mostly of granite and diorite or greenstone.

Very rarely celts or ungrooved axes and arrow or spearheads of copper are found.

Then there are pipes, bannerstones, gorgets, beads, and many other objects the use of which is problematical, together with mostly broken pottery, scattered more or less abundantly about camp sites and washed or plowed out of the ancient burial places.

Thousands and thousands of all of these have been gathered into museums and private collections. From a comparison and study of the different types and forms, and this with what we know of the habits and mode of living of the Indian, has enabled us to form what are probably fairly accurate conclusions as to the uses made of all these different articles by his ancestors.

Among other things left by these original Americans as evidences of their occupancy were earthworks of different forms and it is of these and their preservation that we wish to speak briefly.

Most people know of the great serpent mound in Ohio—an embankment of earth lying along the top of a bluff on the Scioto river. From its widely distended jaws which is a circle of earth conjectured to represent an egg, it runs in a sinuous line several hundred feet back to the coiled tail. Near there is Fort Ancient, and the Great Mound adjoining Cahokia, the former quite likely once a fortified camp.

Iowa has nothing on so extensive a scale as any of these but it does have aboriginal earthworks of more than passing interest, and it seems to us that steps should be taken to preserve some of them for posterity before all are obliterated by the plow.

It may be well to briefly describe what we do have.

The most abundant form is the circular mound. These resemble nothing more than the heaps of earth thrown out by pocket gophers only on a very much larger scale. These mounds where we now find them undisturbed by cultivation are all the way from fifteen to forty feet in diameter and from one to ten feet in height.

The round mounds are believed to have been heaped over burial places, or speaking more exactly about bodies laid on the natural surface either in a sitting or reclining position. Some when opened are found to contain a jumbled mass of bones evidently the gathered up remains of many scattered dead.

In view of the very abundant human remains found in this type of mound in other states we are warranted in considering them as sepulchers, though it is by no means certain that all those in northeastern Iowa are. Nearly all of them when opened show no traces of human remains nor are there any relics. We are forced to the conclusion that they may have been erected for some other purpose or else that they are extremely old. Instead of being hundreds of years or less they may be thousands.

It is entirely possible that some of these heaps of earth along our Mississippi bluff-tops may be among the oldest works of man on the earth.

Knowing this, is it not worth the while to take steps for the preservation of typical groups before the farmer's plow has destroyed them as is already the case with large numbers? Certainly twenty-five and perhaps

fifty per cent of the earthworks of all types in Iowa have been obliterated, and this percentage is increased every year.

Following the circular mounds in numbers are the long straight embankments usually following the crest of divides between ravines. These are all the way from twenty-five to several hundred feet in length, from twenty to twenty-five feet in width, and one to three feet in height. What they were built for we can only conjecture—we certainly don't know—only this, it is certain that they are not fortifications as some think them to be.

The real fortifications or fortified camps, of which there are, or were, a number in the valley of the Upper Iowa or Oneota river, are always enclosures, an embankment of earth entirely surrounding an acre or more of land.

Another very interesting type is the effigy mound, heaping of earth to represent a bird or animal in relief.

Some of these are so well done that it is quite possible to say that they were intended to represent a wild goose, a night hawk, or a buffalo. Others we are not quite so certain of, but we have given to particular forms the names of panther mounds, and to others bear mounds and lizard mounds. In Wisconsin there is one man mound.

On one of the bluffs in the proposed National Park area south of McGregor there is a very fine group of three or four buffalo mounds.

Two lie in what is now pasture and are well preserved. One recognizes the animal at once by the hump on its back and the general pose.

The others lie in a cultivated field and they are only recognized as mounds by the slight elevation of the surface where they were and the different color of the soil. As this pasture is likely at any time to be plowed up, what is probably the only group of buffalo mounds in Iowa will then be destroyed.

Two miles north of North McGregor on top of a high bluff, with a magnificent panorama of river scenery stretching away north and south, lies scattered irregularly about, what is without doubt the finest group of effigy mounds in the state. There are ten animals of the bear form and two birds—night hawks—besides which there are two long embankments.

The greatest length of any of the animals is one hundred feet. From tip to tip of the bird wings is the same distance.

About half-way between Lansing and New Albin on a terrace at the foot of which runs the road between the two towns, and the route of the proposed North Iowa scenic trail, lies a group of round mounds. With three exceptions this group lies in pastures and has suffered no mutilation.

It is probably the most easily accessible good group of mounds of the burial type in Iowa.

Driving along what is even now a fairly good road and which with a moderate outlay could be made a fine one, you stop your car at the foot of the terrace, climb sixty feet to the top, and there they are. Back of them lie high broken and picturesque bluffs; in front the sloughs, lakes, and wooded islands of the river flood plain.

So long as the present owner of the land, Mr. Ed Fish, retains possession of it these mounds will not be disturbed, but should he sell, the next year might see the leveling process with a plow begun.

Efforts are being made to secure an easement in the land for the Allamakee County Historical Society which will permit the owner to use the ground for pasture but which will place the control and preservation of the mounds in the hands of that society and give the public access.

A better way would be to buy outright the entire terrace which contains somewhere between six and eight acres and make of it park. This for the best effect should be closely pastured. There is a growth of small oak trees among and on the mounds and scattering larger oak and hickory on the sides of the terrace. The flat top except for the area occupied by the mounds is a field.

But the necessary funds to purchase are lacking. The animal mound group north of North McGregor, which should be called The Pleasant Ridge Animal Mound Group, as it is on the high promontory terminating that ridge, is even more easy of access than the Fish Mound Group.

You may drive your car right up to and among the noble beasts, and when you have looked them over and wondered why and by what people they were made; where the earth was gotten; how it was carried there. how long they were in building, and have tried to answer these and other questions that might be asked about them, you may look away upon a picture of an old, old shining river with its bordering hills, and valleys between, its lush green islands, coming out of the misty north and running far into the misty south. The world has no fairer, no more peaceful, no more restful picture.

No wonder savage man selected such a spot on which to build an ever enduring totem of his tribe.

As this group lies on good tillable land, and as it has been entirely cleared of forest, and the land belongs to two different owners, it is far more likely to suffer destruction than the Fish group.

We believe a determined effort should be made to secure at least such control of these two earthwork groups as would preserve them, either by lease, easement or purchase, and that action in the matter should be begun at once.—Iowa Conservation Vol. I, No. 3, pp. 45-6.

PARKS AND COUNTRY LIFE.

By B. J. Horchem, State Senator.

We should take hold and appreciate the logic of the situation in this state. Iowa should awake. We can be thankful that we have a body of public spirited men who can realize that the beauty spots of this state should be kept for all the people for all time; that the lakes, the river banks, the hilltops, and almost all the finest parts of the natural beauties of Iowa are now possessed by private persons whose private interests often dictate the destruction of these beauty spots or at least the exclusion of the people from the enjoyment thereof.

I feel that in some particulars we are almost at a turning point in making such provisions for our state which will place it where it truly belongs—as one of the most charming states in the Union.

We should acquire in various parts of the state, large areas that are permanently suited for state parks, and then in each county a memorial park for the boys of the great war should be planted, and in each of these parks should be planted a number of trees to designate the number of boys who took active part in this great war. These parks will be parks of peace and happiness not only for the tired and overworked city people, who long for a glimpse of natural beauty and a place of recreation, but also as places for the homes of birds and wild animals which must be preserved. These places should be under supervision and should be freely used by all the people not only of each county but of the state. This will prove a valuable constructive piece of legislation for in a short time likely, the children of the city will find in the woods and the public parks, the only opportunity within reasonable distance of their homes to enjoy the beauty and restfulness of the forest, the lake, the river and the other peculiar beauty spots, and which should be therefore, permanent means of wholesome public enjoyment for both the present and future generations. These places would be secured in honor of our boys, and would be held in trust by the state for its people. What grand monuments for those who were near and dear to us!

The change in attitude toward the park and boulevard systems has been due in part to the elevation of public taste, which now demands beauty in city plannings. But an exceedingly important factor has been the feeling that beauty is an asset that can be realized in counties.

Life is not for learning, nor is life for working, but learning and working are for life. In brief, I may say that we have had somewhat too much of the gospel of work. It is time to preach the gospel of relaxation. Something like this is the observation of nearly every thoughtful visitor in the United States. We should concentrate intelligence on the plan of recreation and relaxation in a long well ordered and efficient life.

Although state parks are not likely to have the great acreage of national parks, they may prove to be more generally useful as recreation grounds for the great body of the people. Outside the cities the states are most often the natural means to act efficiently in the establishment of large natural parks. Their acquisition is more in the nature of an investment than expense, as the land increases rather than decreases in value.

Someone has said: "Vice must be fought by welfare, not by restraint; and society is not safe until today's pleasures are stronger than its temptations." "Amusement is stronger than vice and can strangle the best of it." Not only does morality then rest back on recreation, but so does efficiency in any direction. One-half of efficiency and happiness depends upon vitality, and vitality depends largely upon recreation, especially the simple recreation of the open air.

The purpose of this introduction is briefly to describe the nature and character of parks and recreation facilities in Iowa and to define roughly the place and future of parks and recreation.

RURAL PARKS IN A PRAIRIE STATE. .

By Thomas H. Macbride, President State University of Iowa.

My theme requires, it seems to me, but smallest introduction. If we all are park enthusiasts, as we should be, to such extent that nothing pertaining to the subject of outdoor art is foreign to our interest, then surely the attempt to so widen our effort and influence that these shall reach country people and rural communities will not fail of appreciation and sympathy here.

Parks the cities have, are sure to have, in increasing perfection as the years go by; but our population is not all in cities by any means, and there must ever remain a wide scope of our domain over which the alderman has no control. It is small credit to us if refinement and an intelligent, sympathetic use of nature be confined to the city. This is a government by the people, and in wisdom or unwisdom, good or evil fortune, we share and share alike.

City people are not as much interested in the proposition that the country should be beautiful as are country people that cities should be healthful and well managed; in fact, we are a nation of enthusiasts, of optimists. We would have the whole land scientifically, artistically occupied and cultivated, the whole country one vast park into which ugliness and misery resultant on an abuse of nature's gifts should never come.

Most of the evils that we attack in an assembly such as this are incident to the fact that we are a new people, acting under popular government. We are, as a people, anxious to do right, but have not yet learned how.

Properly managed parks and pleasure grounds are the product of well directed purpose, active through a long course of years. In a democratic form of government it is hard to develop such a purpose, and especially is it hard to give it continuity of action. Nevertheless, in America we believe that these conditions can both be met—will be met as the years come and go. We are a proud people, proud of our achievements in every direction, and once the movement toward the proper adornment of our heritage begins, national, state, or neighborhood pride will carry our effort to most fortunate conclusion.

Thus far, in the larger part of our national area, time has not allowed for much aesthetic development out of doors. You cannot expect a man to sod his dooryard or plant flowers until the chips are picked up and the mortar on the walls is dry. We have been so busy hitherto building the house that we have had no time to carve the lintel. However, the time has now come for something better—for ornamental work, and it behooves every one who can appreciate beauty in any of its myriad phases to become, if not an artist, at least art's patron. That the time is ripe is plain to the least observant. Attempts at outdoor art are everywhere, and the necessity for outdoor life impresses itself more and more upon our people. There needs but intelligent direction and the ends we seek will soon reach full accomplishment.

The first step in any undertaking is the proper estimate of resources. What capital have we at our disposal? What material with which to

build? To be more precise, it behooves us in the present problem of what may be termed park extension, to inquire in every case what we have to start with; what nature has done, what aid she can be relied upon to furnish. To such inquiry every locality offers, of course, a somewhat different answer; yet there are conditions which effect in the same way in this country a great number of localities at once. The lower Mississippi Valley, for instance, is a forest, the upper Mississippi Valley a prairie in large part. So that the park problem, as it offers itself to any community, has been, in a large measure, predetermined by nature herself, and the very first thing, as it seems to me, that our people need to learn is how to use what they have.

In the Old World there are magnificent parks, forests which are partly used by the people. But whence come they? They have in most instances been planted and guarded by kings and nobles for their own pleasure, and now, in these democratic days, are falling more and more to the share of all men for rational enjoyment and delight. Such are the parks of England, France and Germany. We have over all the more thickly populated portion of our domain groves and woodlands, fountains, hills and rocks, shaped and planted by the King of Kings; and it is simply a question as to whether or not our people are competent to appreciate native beauty as it comes to their hands, and to use that which they inherit.

These, then, are the general principles. Let us see how they apply to a particular case. Of course my own state must furnish the object lesson.

Iowa includes an area of about 55,000 square miles. It is drained by an abundance of rather sluggish streams which trend for the most part south and east. Although commonly classed as a prairie state, it has until recently possessed a very large amount of woodland. Along every stream, in all the eastern part, at least, was a more or less continuous fringe of forests.

Trees being the essential factor in the idea of a park, it is evident that Iowa need never lack such adornment. Trees will grow in Iowa. Trees will grow in all our prairie states much farther west than most people think. Not only is this true but in hundreds of cases the trees are so placed as to give us all the best features of a park to start with. Before the country passed into the control of civilized men, the extension of the forest was limited by fires—prairie fires. Trees grew only where the soil was too poor to sustain a crop of grass, which, by burning, might choke them out, or where the amount of moisture present in spring and fall, the time of fires, was sufficient to prevent conflagration. The result was two fold: First, the trees grew only in that part of the country least desirable for cultivation, on lowlands, as we have noted, along the streams and on sandy or rocky hillsides, in glens and gorges, over precipitous bluffs; and, second, where the trees did grow they were for the most part scattered, especially on higher ground there was much open space between them, so that Iowa woodlands, for instance, were commonly called "Oak Openings."

One could drive through the Iowa forests anywhere. Did one choose to follow some long clay ridge, the trees, chiefly white oaks, opened on every hand, just as in a royal park, and out past their clean, white, weath-

ered boles on a summer day the emerald prairie gleamed and shone on the horizon's edge. Amid the wooded hills and by the rivers existed many a romantic spot, many a cool and shaded nook. Such places to a pioneer were not left long unknown or unchristened, and the names at first bestowed exist today. There are "coves" and "caves" and "dens" and "springs" and "bluffs" and "palisades" and "backbones" without number. It may surprise my readers to learn that according to popular nomenclature, his satanic majesty has his backbone thrust up in several distinct places within the limits of the fortunate state of Iowa. A "backbone" is simply a long ridge of the country rock, rising in an otherwise comparatively level country; a "Devil's Backbone," for instance, rises in Delaware county, its rocky walls washed at their base by the clear waters of the Maquoketa river.

It follows, then, that for nearly all parts of our valley states, parks were, originally, not wanting. All that had been necessary to have given us parks forever had been simply to set apart for the purpose a portion or portions of the country which were really good for nothing else. The early settlers soon discovered the situation. The prairies were occupied and cultivated, the woodland was passed by, and, unfenced, was everybody's picnic ground. Every community had abundant park facilities, and, consequently, the necessity of reserving park grounds did not at all appear. The woodlands, unvexed by fire, grew up in thickets, the oak openings became closed, and genuine forest conditions began to prevail over large areas.

Such was the state of affairs in Iowa until a very recent date. Within the last few decades, however, there has come a decided change. The invention of barbed wire, affording a cheap and easily applied fencing material, especially among trees, and the failure of Nebraska and Dakota prairies to meet the expectations of those who hurried thither, resulted in the exploitation of all unused lands in all the older communities and such are now, where wooded, being everywhere cleared and fenced for agricultural purposes. The result is that, unless some means are taken to prevent it, within a very few years every wooded area everywhere will be entirely stripped of its natural covering, and the primitive parks, the gifts of nature, which have been for so long enjoyed by the people of these newer commonwealths, will vanish forever away.

I do not here speak of other ills that must follow wholesale changes in nature's equipoise, such as these. I do not refer to the drying up of our streams, the destructive erosion of our hills, the bleaching of uncovered rocks which must soon proclaim our inevitable decadence toward barrenness and desert. I speak not now of any of these things; I am urging only that measures be taken to preserve for the people, country folk and town folk alike, the resorts they have, the gifts of providence and nature, admirable in themselves, susceptible of indefinite improvement and competent, if undisturbed, to perpetuate themselves a joy forever.

Moved by what we esteem right considerations, some of us who perceive the necessities of the case have therefore been urging the people of Iowa to reserve for themselves some, at least, of the choicer and more romantic wooded regions of the country as rural parks. Had we a king,

or an emperor, he would doubtless make these reserves for us—always provided he had not a senate to deal with. But since the people are sovereign, the people must act. They will act some day. The great effort is to make them act in time. The axe is so swift; the people are so slow! "Surely," it is claimed, "Mr. Smith will not destroy that beautiful grove, or uncover that delightful spring." But Mr. Smith cannot, perchance, afford to maintain either grove or spring simply for the delectation of his neighbors, however generous it might be in him to do so—Mr. Smith must do that which pays.

If the public likes a grove or a spring which, free gratis, the public has used so long, the public must own it and pay the taxes. There is no other logical solution to the problem. Here and there a Vanderbilt may arise and endow us with park foundations, as millionaires endow colleges, but while we wait for these things opportunity will pass by.

But, it is urged, the idea is impracticable. Perhaps so; nevertheless, something of the kind must be done. Nor is it so impracticable as it might at first sight appear. The thing has been done in New York, in New England, has at least a beginning in Iowa, and will be found practicable everywhere where men earnestly undertake the work. The most hopeful mode of procedure is to persuade town or country authorities to act; to purchase and hold in the name of the people, and for rational use, suitable lands wherever obtainable. In some instances, this has been done; in others a stock company has been organized to hold park property until such time as country or city shall determine to buy. The "Backbone" in Delaware county, Iowa, has been to some extent so managed, and more than 1,200 acres of the most romantic natural scenery the state affords has been saved, by private ownership, at least by the present. Hundreds of people visit the locality every summer, drink the clear water of the springs, rest in the shadow of leafy woods and overhanging rocks.

I have spoken only of the more wooded portions of Iowa; but as a matter of fact what I have said applies to fully three-fourths of the counties of the state, applies to other states, if not to all. In those less favored by nature, the park must be more largely artificial. Trees will grow in every county in Iowa. If in any section of the land trees will not grow, the case is hopeless; for I hold it certain that a country that will not, under any conditions, support trees cannot be the home of civilized men.

But as I said at the outset, I have used Iowa simply as an illustration; what is true of Iowa is true of every state that touches her, of every habitable state in the Union. In beautiful old Kentucky, even, are yet hundreds of splendid groves of primeval forest which shadow fountains and perpetual springs, and which possess, therefore, all that is essential to the recreation and refreshment of weary humanity. Cannot many of these be saved to delight mankind when all primeval woods now standing that cover coveted tillable soil shall have vanished away?

The problem, if we only knew it, goes deep; it touches, as I think, the very perpetuity of our institutions. No man can love an unbeautiful land. No people, no civilized people, can long remain content when all

vestige of natural beauty has been removed from sight, nor can a free government rest upon an unhappy or discontented people. The French revolution came when rural France was almost a desert. The German loves the fatherland because of its beauty. England is a land of parks, not in the gr̃eat cities only, but everywhere from Land's End to John O'Groat's, and we know what Englishmen think of England. If we wish our own people to most speedily reach the maximum of contented peace we shall exert ourselves to preserve to our God-given heritage its original, wonderful features of surpassing natural beauty.

CONSERVATION OF ANIMAL LIFE.

By E. D. Ball.

The love of animals, pleasure in observing life's innumerable manifestations and realities is a primitive and fundamental charatcer in all races of mankind. Evolution's processes have accentuated it in certain races and subordinated in others. Civilization and progress are today the heritage and those races in which this trait has been the most highly developed. The love of animals, the ability to domesticate and develop them to the growing wants of the race has gone hand in hand with human development. The spirit of altruism, a desire to protect and foster has been the keynote of progress that has developed domesticated animals to their present height of perfection and has carried the races that have accomplished this to their present zenith of human power and potentiality.

The lands bordering that narrow strip of water, the English channel, has developed the Clyde and Shire, the Belgian and the Percheron, the four great breeds in horses; the Shorthorn, the Hereford, the Holstein, the Jersey and the Guernsey, all, in fact, of the great breeds of the cattle. Many breeds of sheep and hogs have also been cradled within this area.

The great war now ending has sifted the wheat from the chaff of nations. The peoples who patiently builded these magnificent creations in animal life, established monuments to their altruism, humanitarianism and the appreciation of life's manifestations and possibilities that will endure forever. Their descendants now stand as the champions of liberty and democracy for all the people of the world and worthy descendants of a noble race.

Over against them are arrayed a people equally well situated from every environmental standpoint, arrogantly boastful of their civilization and "kultur," but who have lagged woefully behind in the development of animal life. The German coach horse developed for war purposes, and the Dachshund, misshapen and grotesque, are the highest expressions of their dealings with the great biological forces.

We have before us today as though thrown on a screen a picture of "kultur" with its spiked mustaches drawn back and fixed in death's leer, on its way to the grave, drawn by two magnificent German coach-

ers, symbolic of that nation's perversion and subservience of everything living to the demon of conquest. The hearse is followed by a Dachs-hund, a monstrosity and travesty on animal life, fatefully significant of the lack of symmetry in German philosophy.

That picture should be framed and hung before us as a perpetual warning. We should also be reminded of China and India, their vision shrouded in philosophy and dogma, ignoring for centuries the wonderful possibilities and inspirations of the almost tropical life around them. We should study history and note the permanency and progress of those races that have developed livestock industries. We should study statistics and note that livestock and illiteracy never go together. We should study the lives of the great men of history those that have acquired distinction in special fields, especially those whose achievements have been in the path of world progress; to find that they have been lovers of nature, students of her mysteries and charms; that their philosophies have been the expressions of the organization and development that they have seen in the life around them. And when we have done this we can but realize that the many and varied manifestations of life are an integral and essential part of the natural environment of the human race. That this environment has developed the highest type of thought and the highest motives, and that if we as a race wish to go forward in the path of progress and keep pace with the highest and best development of this world's destiny, we must furnish to the generations to come, the possibility and opportunity of coming into contact with the varied and almost miraculous manifestations of the life of the wood, of the water and the plain.

Hunting and fishing are the natural expressions of this universal instinct—unconscious expressions of a desire for contact with nature. This may be classified as the primitive and fundamental instinct. Hunting and fishing were its highest expressions in primitive man, gradually developing with the race, to the love of animals, of birds and nature's forces, and culminating in the scientist whose passion finds expression in unending exploration into the mysteries of nature and whose researches have contributed so tremendously to the material welfare, the higher development, the health and happiness of the race.

With primitive peoples and in new regions surrounded by vast woods and limitless plains, no provision need be made for the stimulation of this instinct, but as populations increase they have encroached upon the woods and plains until they are so restricted in Iowa today that fishing is a memory and hunting a luxury. If we as a commonwealth, are to develop to our higher possibilities, are to hold within our borders those progressive spirits whose love of nature is a dominant passion, if we are going to give to our descendants the opportunities for contact with the nature that our forefathers possessed we must come to an immediate realization that our wild places are fast disappearing and that it is only by prompt and vigorous action that we can save the few remnants and conserve them to future good of all.

This is neither the time nor place for a detailed discussion of the animal life that should be preserved. It should serve at this time, to lay down the principles that we should maintain and perpetuate the original

flora and fauna of this great region. It will be necessary to preserve as soon as possible, the few remaining places in the state in which we still have the natural conditions under which this life developed. You cannot have the animals of the prairie without the prairie, or the animals of the woods without the woods and underbrush. Birds do not love the smoke and roar and the interminable wires of our cities. They must have woods or prairies, water, sunshine and pure air to break forth into that melody of song which lifts every responsive human soul to higher planes.

We have already lost the buffalo, the deer, the antelope, the prairie dog and the beaver, while the badger, the great turtle, the deer mouse, the star-nosed mole, the glass snake and many other of the familiar animals of our childhood are fast disappearing. These were an integral part of the lives and memories of our forefathers. They studied their habits, were familiar with their mysteries and were brought by these in unconscious contact with the soil, the air and the living world around them. They were close to the spirit of nature—and to the spirit of the infinite.

Iowa is peculiarly rich and varied in her fauna. We have in the northeast portions of the remnants of the life of the far northern regions. In the northwest, an overlapping of the prairie and plains faunas, in the southwest, an extension of the Texan Fauna, while the southeast is visited by stragglers from our tropical climes.

We should establish parks and preserves of the native vegetations of these many and varied regions and protect forever the plant and animal life that once abounded. We should select locations of the marsh and stream for the muskrat, the great turtle, the beaver, the fish and other aquatic forms. We should hold fast to the prairie with at least an antelope, if not the bison and the deer, with the glass snake, the deer mouse, the bob-o-link and the curlew. We should have the woods, the rocks and the cave for the owl, the bat and the chipmunk, and the innumerable songsters whose daily lives are an open book of joy and gladness.

Iowa has developed a wonderful livestock industry. Her horses and cattle are famed, her hog is ubiquitous. Immense sums of money have been spent by the individuals and the state in fostering and developing these animals to the highest type of perfection.

Iowa is also noted for her men and women, her literacy and her prosperity. She has responded nobly to every call of humanity, she has been enterprising and productive in the development of her ideals. Let us spend a small fraction of the sum that has been spent in developing her livestock industry, in provision that her peoples come in contact with the highest and best in life. Let us see that they are able to get away from the sordid and commonplace, from the daily grind of a commercial world and get the contact and inspiration of nature. See that they may watch that never ending chain of progress that has developed the myriads of interacting forms of a life that works out into a harmonious whole. Through such study and such contact comes the breadth and vision that has developed the American nation, has inspired the altruist and the thinker, has fixed and rounded those qualities that are necessary to the highest and best development of our race.

SCENIC DRIVES AND THEIR RELATION TO A STATE PARK SYSTEM.

By Frank H. Culley.

The scenic drive serves two very important missions in the great system of parks. First, there is its natural beauty which is of an aesthetic value, and second, its adaptability as a close connecting link in the great chain of parks which in the future will not only cover our own great state border to border but will cross and merge into the park systems of our sister commonwealths in such a manner as to bring them into one harmonious whole called the national park system.

To understand fully the special value of the scenic drive, we must realize the extent and complexity of the organization of this great American institution—The National Park System, which contains first the national holdings such as national parks, national forests, national monuments, and national reservations, both Indian and military; second, state holdings, such as state parks, and reservations; third, county parks; and fourth, the smaller and more intimate public properties of the township, local community, village, town and city. These lands which have been preserved for their historic interest, their natural beauty, or their service value to the community, represent today about 200,000,000 acres of scattered public property.

To become the more effective and to render to the public the highest service, these scattered areas must be tied together in some systematic manner in order that they may create a harmonious workable whole. With this as one of the objectives in view, the transcontinental and interstate highways, such as the Lincoln and the Jefferson, have been and are being created. These form the skeleton or backbone, as it were, upon which this scheme is being developed. Within the smaller unit, the state, state highways such as the River-to-River and the Daniel Boone are created in order that the state parks and reservations may be tied together and thence connected by means of the national highways to the national parks. This system of highways tying parks and local reservations together is repeated on down through the smallest unit—the community holdings. Thus we find that the national park system, ranging from reservations containing hundreds of acres down to local reservations of perhaps only a few acres resembles a well planned municipal park system such as that of Minneapolis or Kansas City where the boulevards, avenues and streets bind together in one harmonious whole the parks, cemeteries, school grounds, playgrounds, squares, et cetera. While there are many valuable scenic qualities attached to our transcontinental, interstate and state highways, still it remains for the local, less pretentious, but more intimate roadways to serve the purposes of the scenic drive.

Functionally the scenic drive is not a thoroughfare for through traffic, but rather an indirect route or pleasure drive which discourages this through traffic. It has been said that the approach to a house on an estate serves as the connecting medium between different parts of the grounds as well as a means for displaying the various beauties and peculiarities of the place. Just so with a scenic drive, it carries the pub-

lie away from the busy traffic short cuts to lead them leisurely along a pleasure drive with no set goal terminating the drive, but instead with the objectives scattered along its entire length. The spirit of such a drive should be intimacy with the beauties of nature, with the development of such a spirit to meet the individual's need in every day life, thus not leaving it to only such influence as may be felt during an occasional vacation period.

In selecting the location of these drives, there should be determination to reveal the local beauty spots, the inaccessibility of which deprives the public of their appreciation and enjoyment. Such locations might be along the river banks or lake shores thus giving the public not only access to the lake, but at the same time adding scenic value to the drive and increasing the appreciation for the beauties of nature with every trip taken over this route. A drive of this sort may follow along the base of a cliff or bluff now and then passing under the overhanging ledges as one does when driving on the riverside drive in Iowa Falls or along Dugway drive which runs along the river bank at the base of the bluffs in the city park at Decorah, Iowa. A scenic drive along the hillside affords an excellent opportunity for a bird's eye view of the country lying beneath in the valley and to obtain distant views of the surrounding hills. The Air Line drive at Decorah, Iowa, serves just as a purpose. A scenic drive of a larger character is that of the East Iowa Scenic Trail in Winneshiek county. We have other existing scenic drives in the state of Iowa, although they may not be designated by a given name. Thus we find that with the change of our normal perspective and the accessibility of nature's beauty spots, our interests grows and we explore the more recessed and intimate paths afoot. Scenic highways instead of scenic drives would have included the possibilities of seeing nature's beauties by means of our state water ways. A possibility which I will only refer to here.

In designing and furnishing these drives simplicity with the predominating note or motif of naturalness must be the goal. This can be directly applied to the alignment, grade, plantings, and any of the architectural features that may be necessary. Drives of this type should follow closely the natural contours thus eliminating all unnecessary cuts and fills. Cuts and fills to be resorted to only when they will improve the character of the drive and then they should be handled skillfully by a man trained in park designing. This practice need not be resorted to as often as one might be led to believe since heavier grades may be retained on a pleasure drive where heavy traffic problems are not involved. All heavy construction work should be avoided so far as is practicable on this type of drive.

All natural features of interest along the drive, as well as those that may be seen from the drive, should be preserved and treated in the best possible manner. All native planting should be saved and such new plantings as are necessary should be so arranged as to be pleasing and to partake of the character exhibited by the native plantings. Continuous solid plantings are not a necessity since it is quite essential that certain objects, outlooks, and distinct views be seen from the drive; nor

are long lines of symmetrically arranged trees such as we may find on city avenues, good taste in this case.

The furnishings and accessories should be as neat and as simple as possible. Avoid heavy construction and formal effects. Simple neat markers for historic spots or directions should be used while all advertising signs and bill boards should be omitted. This should apply as well to highways other than scenic drives. If architectural features such as bridges and culverts must be added, see that their design is in keeping with their surroundings. It is highly possible that in some situations where the stream is shallow that a paved ford may be as serviceable as a bridge and surely less expensive and artificial. There is a certain thrill to be had when driving through a stream with the water swirling around the spokes of the wheels. This type of construction is not uncommon practice in large rural parks and throughout certain southern states.

If we study carefully the problem of scenic drives first for that location which will make accessible and reveal the natural beauty spots of the small community; second, to give them a natural alignment and a practical grade; and third, to furnish them in a simple natural way we are fulfilling the primary aim of these drives which is to connect and bring together those features of community interest and beauty in such a manner as to create local color the appreciation of which will lead to a greater feeling for and a greater interest in the state parks and in turn for the unlimited aim, the national park system.

This magnificent national park system was conceived in American minds, was born of American progressiveness, and is being developed by American ingenuity. Quoting Professor F. A. Waugh, in this respect, he says: "Nothing like this system of recreation grounds was ever established in any country in the world before, nor was there ever any similar undertaking of such tremendous reach, such high human possibilities." It is the embodiment of the spirit of America as shown through her great asset—the American landscape—with its qualities of bigness, wildness, diversity and versatility.

A scenic drive is a refinement of detail in the national park system which touches the everyday life of the individual and aids in tying the national system together in much the same manner as a ribbon holds together the bouquet.

INDEX

	Page
Abbott, W. A.....	14
Action Needed in Conservation.....	202-5
Action on State Parks by Thirty-seventh G. A.....	284-5
Adirondack Mountains.....	201
Agrimony.....	75
Air Line Drive, Winneshiek county.....	310
Albert, W. E., State Fish and Game Warden.....	26
Alden, Hardin county.....	110, 112, 113
Alexander, See Douds-Leando.....	
Algona, Kossuth county.....	126, 148
Allamakee county.....	19, 184, 276
Allamakee county Historical Society.....	300
Alton lake, Minnesota.....	148
Alumroot.....	89
American Civic Association.....	280
American yew.....	42
Amsterdam, Winnebago county.....	126
Anemone.....	46, 74, 99, 105, 223, 236
Antelope.....	247, 308
Aplopappus.....	55
Approval of Conservation.....	217
Aquatic Phenogams of Iowa.....	221
Arcadian fly catcher.....	97
Arey, (Prof.) Melvin P.....	217, 287, 290
Argonauts.....	269
Army worm.....	257
Arnold's Park, Dickinson county.....	177
Arrowhead.....	99, 236, 252
Arrowwood.....	42, 89
Artichoke.....	167
Artis, (Miss) Lesley B.....	282-3
Ash.....	42, 15, 65, 67, 73, 74, 79, 81, 88, 89, 90, 99, 100, 117, 121, 129, 145, 152, 155, 166, 177, 289
Ashbaugh, Lewis E.....	181
Aspen.....	42, 46, 74, 81, 89, 96, 125, 145, 171
Aster.....	55, 57, 75, 89, 99, 145, 166, 167, 223, 225, 226, 230, 288
Audubon Societies.....	246
Austin, George.....	64
Avery Spring, Van Buren county.....	64
Avocet.....	252
Backbone.....	48
Backbone, Delaware county.....	40, 43, 45, 203
Backbone, Madison county.....	163-5
Badger.....	97
Bailey, B. H.....	242
Bailey, Edwin C.....	103
Bailey, Gideon S.....	63
Bake Oven, Muscatine county.....	72
Ball, E. D.....	306
Balsam fir.....	163, 185, 195
Balsam fir grove, Allamakee county.....	27, 203
Barker, W. H. H.....	160
Barren oak.....	42, 15, 71, 79
Basswood.....	42, 45, 53, 65, 67, 74, 85, 88, 89, 90, 99, 117, 125, 129
Bat.....	308
Bean.....	166
Bear creek, Boone county.....	115
Bear creek, Van Buren county.....	70
Beard tongue.....	53, 56, 223
Beauty of Great Trees.....	32
Beauty of Returning Seasons.....	32
Beaver creek, Polk county.....	150
Belfast, Lee county.....	14, 60, 65
Bell, F. G.....	26
Bellefontaine, Mahaska county.....	158
Bellevue, Jackson county.....	147
Bell flower.....	167
Bellwort.....	46, 75, 99
Bennett, George E.....	18, 244
Benton shale.....	125
Bentonsport, Van Buren county.....	62, 66, 70, 151

	Page
Bertram, Linn county.....	98
Beyer, (Dr) Samuel Walker.....	111, 113, 136
Big Boulder, Floyd county.....	19
Big Duck creek, Van Buren county.....	62
Big Duck marsh, Van Buren county.....	62
Big Duck pond, Van Buren county.....	20
Big Sioux river.....	54, 135, 136, 275, 276
Big Springs, Allamakee county.....	27
Big Timber river. See Cedar river.....	
Big Wall lake, Wright county.....	156
Birch.....	42, 67, 74, 80, 114, 115, 143, 145, 152, 184, 185, 239
Bird Conservation in Iowa.....	242-4
Bishop's cap.....	46, 75, 239
Bison.....	308
Bittern.....	156, 243, 252
Bitternut.....	121, 115
Bittersweet.....	42, 79, 80, 89, 100, 166, 240
Bitterwort.....	240
Bixby, R. J.....	114
Bixby Park, Clayton county.....	19, 144-6, 203
Blackberry.....	74, 288
Black bird.....	156, 248, 252
Black Cat creek, Kossuth county.....	126
Black-crowned night heron.....	243
Black-eyed susan.....	55, 56, 89, 230
Black Hawk, Sac Chief.....	64
Black Hawk Purchase.....	61
Black Hawk War.....	61
Black jack oak.....	65
Black, James.....	87
Blackledge, H. E.....	21
Black oak.....	53, 65, 73, 89, 152
Bladdernut.....	42, 96, 97
Bladderwort.....	80, 236, 252
Blanden's Mill, Webster county.....	88
Blazing star.....	55, 142, 166, 283
Bloodroot.....	46, 89, 99, 105, 143, 152, 223, 239
Blue beech.....	42, 46, 74
Bluebell.....	225
Blue bird.....	120
Blue Earth river.....	148
Blue-eyed grass.....	75
Blue grass.....	56, 57, 67, 75, 166
Blue-gray gnat catcher.....	97
Bluejay.....	253
Blue joint.....	166
Blue-stem grass.....	53, 76, 79, 231
Bluff creek, Boone county.....	115
Bluff Park, Lee county.....	269
Bluffton, Hardin county.....	108, 271
Bobolink.....	252, 308
Bob-white, See Quail.....	
Bonaparte, Van Buren county.....	62, 66, 151
Boneset.....	55, 115, 166
Boneyard Hollow, Webster county.....	19, 86, 91
Boone, Boone county.....	150, 273
Boone county.....	114, 274
Boone river.....	114
Botany of the Devil's Backbone Area in Madison county.....	166-7
Bottle grass.....	75, 76
Box elder.....	42, 54, 67, 89, 121, 166
Bradgate, Humboldt county.....	149
Brandt, (Miss) Clara L.....	21, 22, 72
Brandt, (Miss) Emma C.....	21, 22, 72
Brant.....	247
Bromegrass.....	171
Brown, J. A.....	21
Brown, P. E.....	68
Brushy creek, Webster county.....	93
Bryce, (Viscount) James.....	280
Buckbush.....	67, 152, 155, 166
Buckingham lake, Mills county.....	40, 52, 54
Buckthorn.....	79, 90, 117, 145, 166
Buell, (Mrs.) Martha.....	218
Buena Vista, Lee county.....	151
Buffalo.....	248
Burgess, E. A.....	153
Burgess, (Mrs.) E. A.....	229
Burlington, Des Moines county.....	151, 159, 267, 268
Burning bush, See Wahoo.....	
Bur oak.....	42, 45, 65, 67, 73, 74, 75, 79, 89, 99, 121, 129, 152, 157, 166
Bur reed.....	99, 252

	Page
Burt, Kossuth county	148
Bussey, Marion county	159
Butterfly weed	223
Butternut	42, 65, 67, 87, 89, 99, 100, 121, 145, 155, 159, 289
Buttrick creeks, Webster county	93
Cairo lake, Hamilton county	156
Calamus	156
Caldwell, (Judge) Henry Clay	63
Callirhoe	53
Calmar, Winnebago county	107
Calvin, Samuel	168
Calzas	56
Campbell, Robert W.	159
Cambrian sandstone	270
Canadian bluegrass	166
Canadian yew	115
Cancer root	97
Canton, Jackson county	134, 136
Carboniferous sandstone	75
Cardinal flower	80, 238
Carr, E. M.	48
Carroll, Carroll county	274
Carrot	239
Casey, (Mrs.) Joseph M.	282
Catchfly	57
Caton creek, Boone county	115
Cattail	99, 156, 236, 242
Caves, Jackson county	203
Cedar	239
Cedar Rapids, Linn county	94, 96, 97, 202, 204
Cedar river	71, 73, 75, 94, 98, 142, 143, 144, 155, 167, 197
Cedar Valley, near Osage	111-2
Center lake, Dickinson county	177
Cerro Gordo, Winnebago and Hancock counties	167
Chalybeate Springs, Muscatine county	72
Chandler Cliffs, Mitchell county	141
Cherokee, Cherokee county	275
Chequest creek, Van Buren county	63, 70
Cherry	24, 42, 65, 74, 79, 89, 90, 100, 117, 125, 129, 145, 152, 155, 166
Chestnut oak	42, 65, 67, 74, 79, 121, 166
Chickweed	75
Chinch-bug	257
Chipmunk	308
Chokecherry	42, 65, 67, 74, 85, 89, 125, 152, 155, 166
Clarinda, Page county	158
Clarke, Charles F.	217
Clarke, (Gov.) George W. Arbor Day proclamation	31-32
Clark, (U. S. Sen.) William A.	63
Clayton county	270
Clear lake, Cerro Gordo county	28, 98, 99, 123, 169, 178, 278, 283
Clear Lake an Iowa Playground	101-3
Clear Lake Should Be a State Park	98
Clematis	144, 239
Clermont, Fayette county	109, 218
Cliff brake	143
Cliffland, Wapello county	151, 273
Clinton, Clinton county	114, 185
Clover	55, 56, 57, 75, 76, 89, 166
Club moss	76
Coal Measures Sandstone	88, 93
Coate's creek, Van Buren county	70, 71
Coe college, Linn county	97
Coffee bean	42, 53, 65, 74, 80, 89, 152
Cohosh	146
Cole, Eli, Jr.	146
Columbine	46, 79, 144, 152, 155, 208, 223, 230
Columbus, Louisa county	63
Community Center Enterprises in Relation to State Parks	292-4
Compass plant	55
Conard, Henry S.	224
Coneflower	55, 56, 167
Conservation of Animal Life	306-8
Conservation of Natural Scenery in Iowa	276-9
Conservation of Prairie	283-4
Conserving our Birthright	212-14
Cooper, George R.	26
Coots	243
Coral berry	54
Cordeva, Marion county	89
Coreopsis	56, 166, 167, 225
Cornel	87, 152, 155, 239

	Page
Cornell college, Linn county.....	97
Corson, G. E.....	68
Corydalis	56
Coteaudes Prairies	131, 136
Cotton-boll weevil	257
Cotton-tail rabbit	265
Cottonville, Jackson county	78
Cottonwood	42, 53, 65, 67, 74, 80, 89, 121, 152, 157, 239
Cottonwood river	136
Council Bluffs, Pottawattamie county	54, 102, 202, 275, 283
County Parks	290-2
County Parks and Forests	288-90, 294-7
Cowbane	171
Cowles, (Dr.) H. C.	73
Crabapple	42, 65, 74, 79, 89, 99, 125, 145, 166, 225, 227, 237, 240, 248, 288
Crab grass	76
Cranberry	42
Crandall's Lodge, Dickinson county	176
Cranesbill	118
Cratty, Robert Irvin	221
Cresco, Howard county	106
Crinoid	60
Croton, Lee county	62, 66, 151
Crow	253
Crowley, O. W.	11
Crystal lake, Hancock	109, 126
Cucumber-beetle	257
Cully, Frank H.	200, 309
Cup plant	167
Curlew	254, 308
Currant	42
Curtis, Charles F.	191, 279
Cutworms	257
Daisy	86, 99, 230
Dakota sandstone	59
Dalea	53, 55, 56
Dalles of the St. Croix	204
Dance Hall, Jackson county	79
Dandelion	56
Daniel Boone trail	307
Dark Hollow, Linn county	96
Davenport, Scott county	72, 202, 267
Davenport, George L.	263
Davis, Andrew J.	64
Davis county	70
Day, (Mother) pioneer	103
Day, (Uncle) pioneer	103
Dead Man's lake, Winnebago county	125, 129
Decorah, Winneshiek county	103, 108, 310
Decorah Ice Cave, Winneshiek county	105, 107
Deer	308
Deer creek, Webster county	93
Deer Mouse	308
Delaware county	142, 270
Dell Rapids, Lyon county	136
Denver, Bremer county	289
Description of Pilot Mound	123
Des Moines, Polk county	63, 66, 150, 159, 160, 199, 202
Des Moines Bluffs in Mahaska county	154-5
Des Moines river	20, 60, 68, 69, 70, 85, 87, 91, 113-5, 122, 134, 147, 155, 159, 198, 251, 273
Des Moines River Bluffs near Leighton	158-9
Des Moines Bluffs State Park	159
Devil's Backbone, Delaware county	11, 272, 304
Devil's Backbone, Madison county	19
Devil's Cave, Boone county	120
Devil's Lane, Muscatine county	72, 272
Dewberry	67
De Witt, Clinton county	283
Diagonal trail	111
Diamond lake, Dickinson county	177
Dickinson county	176
Diehl, William W.	122
Dillon, John F.	62
Dining Room, Jackson county	79
Disappearance of Native Plants in Iowa	235-7
Dogwood	42, 65, 67, 74, 89, 90, 114, 117, 145, 166
Dorr, M. L.	218
Douds-Leando, Van Buren county	64, 66
Douglas, David	87
Dragon root	252

	Page
Dragon's head	117, 171
Drainage of Cerro Gordo county	168-9
Drake, F. E.	91
Drake's Gulch, Webster county	92
Dropseed grass	56, 57, 76
Dubuque, Dubuque county	19, 102, 104, 147, 185, 202, 272
Dubuque county	80, 270
Duck	156, 243, 250, 254
Dug Way, Winneshiek county	105, 310
Duncan, Hancock county	312
Dunham, George W.	14
Dunning's Spring, Winneshiek county	105
Dutchman's breeches	46, 86, 105, 146, 155
Dutton, (Mrs.) Viva	26
Eagle City, Hardin county	111, 112, 113
Eagle lake, Hancock county	197, 242, 243
East Iowa Scenic trail	310
Echinoderms	60
Edgewood, Clayton county	42, 144
Elderberry	42, 288
Eldon, Wapello county	14, 60, 61, 64, 65, 66
Eldora, Hardin county	110, 112, 197
Eldora sandstone	112
Elephant Bluff	271
Elk	247, 248
Elk creek, Boone county	115
Elk Run, Hardin county	112
Elkader	218
Ellsworth, Minnesota	135
Elm	12, 45, 53, 65, 74, 80, 88, 89, 90, 96, 99, 100, 117, 121, 145, 152, 157, 159, 166, 289
Ely's Branch, Van Buren county	24
Emerson, Mills county	58
Emmet county	274
Emmetsburg, Palo Alto county	149, 275
Establishing of National Forest Reserves	215, 217
Estherville, Emmet county	149, 273
Etzel, (Mrs.) J. L.	283
Evans, H. C.	32
Evanston, Webster county	91
Everett, (Mrs.) Leonard	283
Everlasting	56, 89, 167
Eversole creek, Boone county	115
Evolution of Forest, Park and Conservation Sentiment in Iowa	263-6
Executive Council	14, 15
Fairport, Muscatine county	72, 73, 267
Farmington, Van Buren county	20, 61, 62, 66, 69, 151
Favorite, (steamboat)	178
Fayette county	270
Fern	42, 54, 76, 80, 90, 92, 97, 105, 114, 118, 143, 144, 145, 155, 239
Findlay, Charles V.	90
Fireweed	132
Fish, Ed.	300
Fish Mound Group	200
Fitchner, Otto	73
Five fingers	57
Flandreau	124, 136
Flax	56, 57, 89
Fleabane	56, 89
Fleming's Mill, Delaware county	48
Flint Hill (early settlement)	263
Flora of Jackson and Dubuque counties	79-81
Flora of Mitchell county	112-4
Flora of the Bogs of Cerro Gordo and Worth counties	171
Flora of the Ledges	122
Florenceville	108
Foglesong, L. Earl	11
Forbush, E. H.	246
Ford, John F.	11, 14, 16, 17, 18, 88
Forest and Game Preserves in Iowa	279
Forest City, Winnebago county	123, 124, 125, 126, 283
Forest Flora of Hardin county	113-5
Forestry Notes for Pilot Mound Area	126-7
Forest Parks and their Relation to the Rural Community	191-2
Forest Parks in Iowa	192
Forest Trees and Shrubs in Boone county	121
Forest Trees of Muscatine county	71
Forests and their Relation to Stream Flow	195-200
Forestville, Delaware county	47
Fort Armstrong	263

	Page
Fort Atkinson, Winneshiek county	104
Fort Des Moines, Polk county	161
Fort Dodge, Webster county	87, 88, 91, 102, 149, 161, 273
Fort Madison, Lee county	282
Foster, (Mrs.) A. J.	110
Foster, Frank E.	109
Four o'clock	56, 57
Fox-glove	57, 75
Fox Island	63
Fox river	70
Franklin county	112
Francis, (Sen.) Leslie E.	175
Frazier, Boone county	89, 122, 150, 273
Free Thought Colony	62
Fremont county	19, 158
Fremont, John C.	176
Fuller, Hal C.	91
Gable Farm	143
Galena limestone	107
Galena-Plattville limestone	162
Galland, Lee county	269
Gallinule	243, 253
Game Protection in Iowa	255-60
Gar lakes, Dickinson county	177
Garner, Hancock county	125
Gate City (newspaper)	62
Geese	247, 250, 252
Gentian	89, 171, 223, 236, 252, 283
Geology of	
Delaware county	47-8
Hardin county	111-13
Lyon county	134-6
Mills county	58-60
Muscatine county	71-2
Palisades	98
Van Buren county	67-71
Webster county	93
Geranium	143, 239
Gettysburg, Pennsylvania	201
Gifford, Hardin county	111
Gifford Terrace	112
Gilbert, Winifred	125
Ginger	46
Ginseng	75
Gitchie Manito Park, Lyon county	130
Give Beauty its Rightful Place	34
Glass snake	308
Glen Park, Wisconsin	204
Glenwood, Mills county	54, 58, 157
Goat's beard	75
God's Great Out-of-Doors	36-7
Goldenrod	55, 57, 75, 86, 99, 145, 166, 167, 228, 230, 283, 288
Goodell, E. E.	23
Gooseberry	42, 74, 85, 227
Gordon, Charles H.	69
Gould, Jay	160
Grape	42, 54, 67, 74, 79, 89, 143, 144, 145, 166, 227, 239
Gray, (Dr.) Asa	80
Great auk	254
Great Plains	131
Greater Iowa Association	280
Grebe	243, 252
Greene county	93, 274
Greene, Wesley	263
Green Island, Jackson county	80
Grosbeak	97
Gum weed	53, 55
Guttenberg, Clayton county	272
Gypsum	88
Gypsum Hollow, Webster county	88
Hackberry	42, 45, 53, 65, 67, 74, 80, 100, 155, 166
Half Breed Tract, Lee county	61
Hamburg, Fremont county	53, 54
Hancock county	111, 197
Hancock, (Capt.) Frederick	62
Happy Hollow, Buckingham lake area	54
Hardin City, Hardin county	111
Hardin county	109, 113, 115, 274
Harding, (Gov.) W. L.	3, 12, 14
Inaugural address	31

	Page
Harlan, Edgar R., Secretary Iowa State Board of Conservation.....	2, 11, 14, 15, 17, 18, 60, 91, 98, 160
Hart, (Mrs.) Pervilla Alsever	85
Hartwick, Poweshiek county	48
Harvey, Marion county	150, 160
Haw	42, 65, 74, 89, 145, 227, 240
Hawk	252, 253
Hawker, H. W.	71
Hawkeye highway	111
Hawkweed	76
Hawthorne	240, 248
Hayden, Ada	282
Hayes, Gordon	157
Hazelnut	42, 67, 74, 125, 152, 155, 166, 289
Head of Death, See Tete des Morts	
Helenium	228
Hemlock	46, 96
Henderson, Mills county	58
Hennepin, (Father) Louis	91, 146, 176
Henning, Carl F.	116
Henton, Mills county	58
Hepatica	46, 89, 105, 143, 146, 223, 240
Heron	243, 252
Hickory	45, 65, 67, 74, 87, 88, 89, 96, 99, 121, 145, 159, 166, 177
Hillsdale, Mills county	58
Hinkles, (pioneer family)	64
Hinsdale, Wapello county	66
Hinshaw, Elmer C.	17, 186
Historical Department of Iowa	218
Historical Society of Iowa	218
Hoadley, B. W.	107
Hog-pea	75, 89
Holady creek, Webster county	92
Holcomb creek, Van Buren county	70
Holdegel, Perry C.	19
Honey creek, Van Buren county	71, 122
Honey locust	42, 53, 65
Honeysuckle	42, 74, 79, 100, 114, 144, 145, 240
Hophorn beam	67, 96, 121, 152, 155
Horchem, (Sen.) B. J.	284, 306
Hornaday, (Dr.) W. T.	243, 247
Horse mint	56, 166
Hosackia	57
House, (Mrs.) A. J.	79
Hoyt, E. H., Treasurer of State	11, 17, 18
Huckleberry	74, 76
Hyacinth	75, 236, 252
Hypnum	111
Ice Caves, Winneshiek county	19, 271
Independent, See Selma	
Indian creek, Van Buren county	66, 70
Indian Head Bluff, Mitchell county	144
Indian pipe	97, 143
Indian spring, Des Moines county	272
Indian trails	54
Indian turnip	117, 167
Indigo	42, 74, 89
Interstate Power Company, Winneshiek county	106
Interstate trail	111
In the Switzerland of Iowa	103-7
Introduction	1-2
Inyan-Sha-Sha- Watpa, See Des Moines river	
Iowa Central R. R.	112
Iowa City, Johnson county	197, 197
Iowa Falls	112, 156, 197, 273, 283, 310
Iowa Federation of Women's Clubs	282
Iowa Forestry and Conservation Association	260
Iowa lake, Kossuth county	118
Iowa river	24, 109, 113, 115, 197, 273
Iowa's Native Plant Life	229-31
Iowa's Waterfowl, Shore and Marsh Birds	250-2
Iowa thistle	167
Iowaville, Van Buren county	64
Ioways, Indian tribe	64
Ireland, Archbishop	91
Iris	99, 143, 236, 242, 252
Ironweed	55, 142, 167
Ironwood	42, 46, 53, 74, 89, 121
Irvington, Kossuth county	118
Ivanhoe Bridge, Linn county	98

	Page
Jack-in-the-pulpit	42, 86, 223, 230
Jackoak	99, 129
Jackson, (Mrs.) J. C.	233
Jackson county	88, 272
James river	134, 136
Jasper pool, Lyon county	137, 276
Jefferson county	21
Jefferson highway	111, 279, 309
Jewel Junction, Hamilton county	156
Jewelweed	114, 144, 167, 239
Job, Herbert K.	246
Johnson, W. H.	74
Joint grass	56
Jones, Ira W.	98
Jones, L. E.	110
Jordan, (pioneer family)	64
Jordan Homestead, Van Buren county	64
Jordan sandstone	162
Juniper	42, 81
Kappel, (Mrs.)	19
Kay, (Dr.) George F.	18, 153
Kelley, (Prof.)	18
Kellog, Harriett S.	237
Kelso, Joseph, Jr.	11, 14, 16, 17, 88
Keokuk, Lee county	66, 106, 151, 267, 269, 270
Keosauqua, Van Buren county	19, 63, 66, 70, 151, 273
Ketcham, B. F.	20
Keyes, (Prof.) Charles R.	18
Keyes Knob, Lyon county	137
Kilbourn, Van Buren county	63, 66, 69, 71, 151
Kingfisher	100
Kneeland, Abner	62
Knotweed	56
Knoxville, Marion county	61
Koren, (Rev.) Vilhelm, Norwegian emigrant	104
Kossuth county	126
Kuhnia	166
Lacey, (Major) John F.	35, 158, 207
Lady-slipper	90, 117, 144, 236, 238
Lake Cooper, Lee county	269
Lake Harmon, Winnebago county	126
Lake Itasca Park, Minnesota	204
Lake of the Woods	241
Lake Park, Dickinson county	177
Lakes of Iowa	179-81
Lake View, Sac county	178
Lamont, Buchanan county	45
La Motte, Lussiere, French officer	147
La Motte, Jackson county	146
Lane, Franklin K., Secretary of Interior	34
Lansing, Allamakee county	106, 299
Larkspur	56, 152
La Salle, Rene-Robert Cavalier	147
Law creating Iowa's parks	7-10
Lazell, Frederick J.	17, 36, 95, 202
Lazell, (Mrs.) Frederick J.	18
Lead plant	57, 74, 89, 166
Leatherwood	42
Le Claire, Antoine, (Indian interpreter)	263
Ledges, Boone county	19, 89, 115, 150, 184, 273
Ledges, Nature's Gift to Iowa	116-21
Lee county	20, 269
Leech lake, (Indian reservation) Minnesota	214
Lees, James H.	43, 76, 94, 107, 141, 147, 155, 162, 163, 270
Le Fevre	147
Le Fevre river	146
Lehigh, Webster county	91, 93
Lettuce	56
Lewis and Clark expedition	176
Lexington, Van Buren county	63
Lick creek, Van Buren county	63, 70, 71
Licorice	57
Lily	100, 142, 236, 252, 283
Lime creek, Cerro Gordo county	168, 273
Lime creek, Winnebago county	125, 126, 129, 167
Lincoln, George	243
Lincoln highway	96, 279, 309
Linden	D, 100
Lisbon, Linn county	94, 98
Little Rock, Lyon county	136

	Page
Little Sioux river	177
Little Wall lake, Hamilton county	155-7
Livermore, Humboldt county	149
Lizard creek, Webster county	88, 93
Lobelia	56, 114, 167
Loco weed	53, 55, 56
Locust	67, 74, 80, 89, 152, 155
Loess	47
Loess Area of Western Iowa	55-7
Lookout Mountain, Tennessee	201
Lost Island lake, Palo Alto county	275
Louisa county	268
Lousewort	146, 75, 171
Lower Des Moines	152-3
Lower Des Moines Area	14, 40, 65-9
Lungwort	46, 89
Luther college, Winneshiek county	104
Macbride, (Dr.) Thomas H.	3, 34, 123, 126, 154, 179, 195, 215, 287, 302
McCrory residence, Van Buren county	62
McDonald, (Prof.) G. B.	18, 47, 192
McDonald, Thomas	11
McGregor, Clayton county	19, 80, 128, 160, 204, 218, 271, 279, 299
McGregor's Landing (early settlement) Clayton county	104
McNider, (Mrs.) May H.	18, 99, 123, 279, 282
Mahaska county	160
Mallard	247
Mallow	53, 56
Manchester, Delaware county	45
Mandrake	80, 89, 152, 155
Maple	42, 45, 54, 65, 67, 74, 80, 89, 90, 117, 121, 125, 143, 144, 145, 155, 166, 225, 289
Maquoketa, Jackson county	76
Maquoketa river	45, 46, 47, 76, 79, 272, 304
Marchautia	97
Marigold	56, 143, 283
Marsh elder	56
Marsh thistle	171
Marshall county	111
Marshalltown, Marshall county	102, 197
Mason City, Cerro Gordo county	123, 169, 280
Mather, Stephen T.	34
May apple	117
Meadow grass	75, 76
Meadow lark	283
Mediapolis, Des Moines county	268
Medium lake, Palo Alto county	149, 275
Meigs, (Major) Montgomery Cunningham	152
Merriam, C. Hart	111
Mesquite grass	53
Mexican cosmos	208
Middle river	163, 165
Milford, Dickinson county	278
Milk vetch	53, 166
Milk weed	53, 56, 100
Mill creek, Mills county	58
Mills county	19, 158
Mill Spring, Winneshiek county	108, 271
Mink	97
Minnesota river	136
Mint	56
Mississippi river	61, 71, 79, 114, 136, 146, 198, 204, 214, 279
Mississippi Valley National Park	207, 218
Mississippi Valley Scenic Matters	218
Missouri Boundary War	62
Missouri golden rod	56
Missouri river	251, 275
Missouri river bluffs	52
Missouri river flood plain	52
Mitchell, Mitchell county	134, 136, 141, 144
Mitchell county	143
Moccasin flower	42, 146, 208, 230
Moingona, Boone county	113, 115, 150
Monkey Mountain, Wapello county	152
Monkey Mountain Area near Ottumwa	152
Monona county	275
Montgomery county	18, 151
Montpelier, Muscatine county	73
Montrose, Lee county	269
Moonseed	89, 144, 145, 166, 238
Moosewood	90, 117

	Page
Moorehead Caves, Jackson county.....	40, 76, 79
Morbeck, G. C.	205
Mormon Ridge, Marshall county.....	249
Mormons	269
Morning Glory	57, 75
Mott, D. C., Asst. Secretary Board of Conservation.....	26
Mounds, Van Buren county	64
Mt. Hope	271
Mt. Vernon, Linn county.....	94, 96, 97, 98, 272
Mt. Zion, Van Buren county.....	66, 151
Mud creek, Mills county.....	58
Mud hens	156, 252
Mueller, H. A.....	215
Mulberry	65, 67
Mulhall, (Mrs.) John	283
Munn, (Mrs.) A. W.....	283
Muscatine, Muscatine county.....	267
Muscatine island	75
Muskrat	276
Musquakie Indians, (Foxes)	24
Mustard	46, 56
Myron, Allamakee county	163
Napoleon, Van Buren county.....	62
Nashua, Chickasaw county	18
Nashville, Jackson county	269
National Park and Forestry Reserve Resolutions.....	214-5
Natural Bridge, Jackson county.....	19
Natural Bridge and Caves, Jackson county.....	76-7
Natural Park Site.....	51
Nature Was Kind to Iowa.....	31
Nauvoo, Illinois	269
Needle grass	57
Need of Recreation	33
Nelson, (pioneer family)	64
Netzer, G. M.....	101
Nevada, Story county	211
New Albia	299
Newberry, (Sen.) B. W.	11, 14
New Era Community Center.....	72
New Jersey tea	55, 57, 74, 152, 166
Niagara Falls	201
Niche	72
Nicollet, Jean	154
Nightshade	76
Ninebark	42, 79, 97, 117, 145, 166
Nishnabotna river	58, 157
North central Iowa region.....	19
Northeastern Iowa	19
Norton, William Harmon	98
Notes on Buckingham Lake Area.....	52-4
Oak	85, 88, 90, 96, 125, 143, 145, 177, 243, 289
Oak Openings	303
Objects of Park and Forestry Association.....	217
Oat grass	114
Ocheyedan, Osceola county.....	153
Ocheyedan Mound, Osceola county.....	153-4, 274
Ocheyedan river	153
Odessa lake, Muscatine county.....	19
Okoboji lake, Dickinson county.....	28, 274, 278
Old Church Tree, Van Buren county.....	63
Old Farm, See Gable Farm	
Old Limekiln road, Mitchell county.....	143
Old Mill, Mitchell county	144
Oleson, O. M.	87
One of Nature's Beauty Spots.....	85-7
Oneota river	109, 162
Oneota River at Decorah	107-9, 204, 271
Opossum	97
Orchid	90, 96, 143, 236, 238
Orr, Ellison	27, 163, 297
Osage, Mitchell county	141
Osceola county	142, 274
Oskaloosa, Mahaska county.....	155, 159, 283
Otho, Webster county	85, 90
Ottumwa, Wapello county	19, 61, 89, 151, 160
Our Lakes and Rivers.....	184-6
Our Lakes Need Protection.....	178-9
Our Playgrounds Without Rivals.....	34
Our Rich Natural Scenery.....	34
Owen, David Dale	113

	Page
Owl	252, 253, 308
Owl's head	271
Ox-eye	55
Oxford Junction, Jones county	19
Paige, F. W.	91
Paine, Albert Bigelow	63
Paint brush	46, 55, 56
Painted-cup	46, 142
Palastine, Van Buren county	62
Palisades	97
Palisades, Linn county	18, 203
Palisades, Lyon county	136
Palisades of the Cedar River	95-8, 272
Palisades Should Be a State Park	94-5
Palo Alto county	149, 274
Pammel, (Dr.) L. H., Chairman Board of Conservation	3, 6, 11, 14, 17, 18, 41, 45, 52, 55, 65, 72, 79, 87, 113, 115, 116, 117, 121, 144, 152, 154, 163, 166, 167, 178, 207, 215, 217, 236
Parks and Country Life	300-1
Parks in Connection with State Highways	286-7
Park Sites Along Upper Des Moines Valley	147-52
Parnassas	171
Paroquet	254
Parnsip	89
Partridge berry	239
Partridge pea	56, 166
Pasque flower	55, 208, 238, 283
Passenger pigeon	254
Paw-paw	65, 80, 114
Pearse, R. J.	292
Pease creek, Boone county	115, 117, 150
Peat bogs	197
Pecan	65, 80
Pellett, Frank C.	229
Pelton's Woods, Mitchell county	144
Pennyroyal	166
People Urged to Plant Trees	31-2
Peosta, Fox Indian Chief	147
Peters, Lee	136
Phalarope	252
Phebes	97
Philadelphia, See Kilbourne	
Phlox	75, 143, 225, 238
Pickereel weed	252
Pickett, Charles E.	62
Pictured Rocks, Clayton county	272
Pierce's Bridge, Mitchell county	143
Pignut	42, 67, 74, 89
Pike's Peak Area	19
Pilot Knob, Hancock county	274
Pilot Knob Should Be a Park	127-9
Pilot Mound, Winnebago county	125, 129
Pilot Mound Area	19
Pilot Mound Beauties	125-6
Pilot Rock, Cherokee county	275
Pillsbury Point, Dickinson county	176
Pine	113
Pine creek, Muscatine county	71, 73, 75, 113, 114
Pine groves near Waterville	27
Pink	230
Pin oak	65, 80
Pin pinella	89
Pintail	247
Pittsburg, Van Buren county	63, 66, 71
Place of Outdoor Recreation in our Modern Civilization	207-9
Pleasant Hill, Van Buren county	63
Pleasant Prairie station, Muscatine county	72
Pleasant Ridge Animal Mound Group	300
Ploughman, Emory	21
Plowser	252
Plum	42, 46, 74, 79, 89, 125, 166, 227, 231, 288
Plum creek, Delaware county	48
Plum creek, Kossuth county	126
Plymouth, Cerro Gordo county	62
Plymouth Rock, Cerro Gordo county	108, 271
Poison ivy	42, 51, 89, 166
Polk, Jefferson S.	160
Pomme de terre	55, 56
Pond lily	129, 156, 236, 238, 252
Poplar	42, 46, 85, 145, 243
Portland, See Douds-Leando	

	Page
Port Oro, Van Buren county	63
Post oak	65
Postville, Allamakee county	19, 162, 218
Postville, Shelby county	106
Potato beetle	257
Potosi	147
Prairie chicken	248, 259
Prairie cone flower	89
Prairie creek, Webster county	87, 93
Pratt, Herbert	89
Preserving the Indian Mounds along the Mississippi	297-300
Preservation of Iowa Lakes	181-4
Preservation of Native Plants	237-41
Preservation of Places of Historic Interest	209-12
Preservation of Wild Plants in Iowa	221
Preserve and Improve Our Lakes	186-7
Preserve the Trees	35
Price, (Mr.)	87
Prickly ash	74
Primrose	89
Proceedings of Board of Conservation	11-28
Proposed Park at Buckingham Lake	51-2
Protecting the Migratory Birds	247-50
Psoralea	56, 166
Public Parks of Iowa	7-10
Puccoon	55, 56
Pulpit	79
Pulpit Rock, Winneshiek county	105
Pussy willow	46
Pyrola	239
Quail	257
Queen Anne's lace	230
Quercitron oak	42, 79, 145, 152, 166
Raccoon forks	60, 161
Raccoon river	93, 97, 198
Ragweed	53, 56
Rail	243, 252
Rainy river	239
Rapids	63
Raspberry	42, 74, 85, 145, 166, 288
Ratchiff, W. C.	17
Rattlesnake plaitain	75
Red bird	53, 65, 67, 74, 152
Red cedar	42, 45, 81, 89, 90, 117, 145, 166
Red oak	42, 45, 53, 65, 67, 74, 79, 89, 121, 129, 145, 157, 158, 159, 166
Red river valley	136
Red Rock, Marion county	19, 89, 150, 160
Red Rock Bluff, Marion county	150, 273
Red Rock region, Marion county	160-2
Red Rock sandstone	119
Redstone, Minnesota	134, 136
Reed canary grass	236, 252
Reed creek, Van Buren county	70, 71
Rees, (Sgt.) H. E.	21
Reeves, Elmer	288
Reid, W. H.	68
Reindeer lichen	118, 155
Reindeer Lichen at the Ledges	116
Relation of State to National Parks	200-2
Relation of the Community to the Preservation of Wild Plants	224-27
Report on	
Backbone area	41
Lower Des Moines area	60-5
Wildcat Den	72-6
Reports to	
Executive Council	3-6
Gov. W. L. Harding	3-6
Reppart, Ferdinand	71
Resolutions	11, 13, 14, 16, 22-3, 28
Resolutions, Iowa Conservation Association	218
Resolutions of the Academy of Sciences	214-15, 215-17
Rice	242
Rice cut grass	76
Rice lake	167
Richards, Seth	63
Rickey, Lacey F.	158
Ringgold county	93
Rising Sun, See Pittsburg	
River-to-river highway	309
Roach, (Miss) Lena	282

	Page
Roberts, H. L.	23
Robinson, (Buckley)	122
Rochester, Minnesota	104, 154, 159
Rock creek, Van Buren county	58, 63
Rock Rapids	282
Rock Run, Hardin county	110, 112
Rocky mountain bee plant	53, 56
Rose	42, 67, 74, 81, 89, 152, 222, 267, 288
Rosin weed	228
Ross, (Gov.) of Texas	63
Rosseau, Marion county, (early settlement)	162
Rue	46, 100, 146, 171, 230
Ruffed grouse	97
Rural Parks in a Prairie State	302-6
Rush	46, 55
Ruthven, Palo Alto county	275
Ryan farm, Mitchell county	144
Rye	56
Sacs and Foxes, Confederated Indian tribe	64, 146, 161
Sage	56
St. Donatus, See Tete des Morts	
St. Jacob's ladder	46, 75
St. John, R. T.	26
St. Louis limestone	70
St. Paul, Minnesota	104
St. Peter sandstone	162, 270, 272
Salubria	62
Salvia	239
Sandhill crane	248
Sand piper	252
Sandusky, Lee county	269
Sandwort	75
San Prairie, See Vincennes	
Sarsaparilla	75
Saunders, Euclid	18
Savage, Thornton Edmund	78
Sawyer, (Mrs.) Bernice Lacey	283
Saylor cabin	64
Scenery at Iowa Falls	109-11
Scenic Drives and Their Relation to a State Park System	309-11
Schermerhorn, Zellah M.	212
Schmidt, G. Perle Wilson	209
Scott, (Miss) Sadie Rae	27
Secor, Arthur J.	21
Secor, Eugene	124, 127
Sedges	89, 156
Selma, Van Buren county	64
Seneca snakeroot	89
Sequoias	195
Service berry	42, 74, 79, 89, 115, 155
Shadtree	96, 227
Sharp, Abbie Gardner	176
Shellbark hickory	42
Shenandoah, Page county	158, 283
Shimek, (Prof.) Bohumil	73, 217, 276
Shin leaf	46
Shingle oak	152
Shooting star	208
Side oats	57, 166, 231
Siloam Springs, Hardin county	110
Silver city	58
Silver creek, Mills county	58
Silver lake, Dickinson county	177
Silver lake, Minnesota	148
Siouan mountains	121
Sioux, Indian tribe	134, 146
Sioux City, Woodbury county	53, 102, 153, 202, 275, 283
Sioux Falls	137
Sioux Quartzite	136-7
Skinner creek, Webster county	93
Skullcap	56, 166
Skunk	97, 276
Skunk river	115, 121, 122, 157, 198, 269
Sleepy Hollow, Linn county	96
Slough grass	231
Small, (Mrs.) W. B.	51
Smith, Joseph	64, 269
Smith, (Patriarch) Ashael	64
Snipe	243
Snowberry	42, 54, 55, 56
Snow-on-the-mountains	56

	Page
Soldier creek, Webster county.....	88
Solomon, F. A.	23
Solomon's seal	75, 99
Some Geological Aspects of Conservation.....	270-6
Somes, M. P.	87
Sondrol, (Mrs.) Carrie P.	99
Sorrel	56, 57, 74
Source of Water Supply of Clear Lake.....	101
Southeastern Iowa	19
South fork river	11, 113
Southwestern Iowa	19
Spanish bayonet	56
See also yucca	
Spanish needle	167, 171
Sparrow	252
Spatter dock	80
Specht's ferry, Dubuque county	80
Spiderwort	100
Spikenard	99
Spillville, Winneshiek county.....	109
Spirit lake, Dickinson county	28, 177, 210, 263, 274, 278
Spirit Lake and the Okobojis.....	175-8
Spleenwort	145
Split Rock creek, Lyon county	136
Spring beauty	42, 46, 54, 86, 143, 145, 155, 223, 225, 230
Spring branch	46
Spring Hollow, Linn county	96
Spring Park, Mitchell county	143
Spruce	171
Spurge	56
Spurrell, J. A.	235, 250
Squaw creek, Boone county	115
Squaw creek, Johnson county.....	241
Squirrel	121
Staff tree	54
Standard, (Gov.) of Missouri.....	63
State Parks and Public Welfare.....	205-7
Steamboat Rock, Hardin county.....	19, 86, 111, 112, 114, 184, 203
Stevens, T. C.	253
Stevenson, W. H.	68
Storm lake, Buena Vista county.....	19, 178, 274, 278
Stone Park, Woodbury county.....	153
Story county	121
Strawberry	75, 89, 99
Strawberry Point, Clayton county.....	45, 51
Stump House, Van Buren county.....	64
Sugar creek, Mitchell county	143
Sumach	42, 46, 54, 57, 65, 74, 89, 100, 120, 145, 166, 288
Sun flower	56, 57, 143, 167, 283, 288
Supplementary report of the Devil's Backbone.....	45-7
Sunset from Pilot Knob	124-5
Swan	248, 250, 252
Swan lake, Dickinson county	177
Swamp oak	67, 74, 80
Sweet cicely	89
Sweetland, Muscatine county	75
Sweetland creek, Muscatine county.....	114
Sweet william	46, 56, 75, 80, 89, 100, 118, 155, 167
Switch grass	57, 79
Sycamore	42, 65, 67, 74, 80, 152, 159, 166
Tabor, Fremont county	54, 58
Tama, Tama county	24
Tamarack	171
Taylor, (Mrs.) H. J.	27, 221
Teal	247, 252
Tern	156
Tete des Morts, Jackson county	146
Tete des Morts and Vicinity.....	146-7
Tete des Morts creek, Jackson county.....	146
Thistle	56, 100
Thompson, (Mrs.) Burt J.	283
Thorn apple	99
Thornton, Cerro Gordo county.....	170
Tickle grass	57, 79
Tick trefoil	75, 89, 166, 167
Topography of Boone county.....	115
Topography of Morehead Caves Area.....	78
Touch-me-not	99, 155
Touring in Iowa's Nooks and Corners.....	267-70
Tracy, Marion county.....	150, 159
Trenton limestone	104

	Page
Trillium	42, 46, 75, 86, 105, 146
Truax, T. R.	294
Trumpet creeper	65
Tunnel Mill, Madison county.....	165
Turin, Monona county	275
Turkey river	109, 272
Turkey vulture	97
Turk's cap	236
Turtle's head	75, 143
Tuttle, Flora Mae	142
Tuttle lake, Emmet county.....	148, 275
Twain, Mark	23
Twin flower	239
Twin lakes, Calhoun county.....	155, 275
Twin lakes	19, 28
Twin lakes, Winnebago county.....	126
Two Mile creek, Webster county.....	88, 149
Udden, John A.	52, 71
Union Slough, Kossuth county.....	148
Union, Hardin county	111
Upper Coal Measures	165
Upper Des Moines river.....	89
Upper Iowa river	106
Valder college, Winneshiek county.....	106
Van Buren county	20
Vernon, Van Buren county.....	63
Vervain	55, 56
Vesca	89
Vetch	42, 46, 54, 57, 75, 80, 89, 231
Vincennes, Lee county	151
Violet	42, 46, 54, 57, 75, 80, 86, 89, 99, 105, 146, 152, 225, 230, 238, 282
Virginia creeper	42, 54, 74, 89, 126, 145, 166
Virgin's bower	143
Wabonsie lake, Mills county.....	58
Wahoo	42, 90, 97, 166, 239
Wake robin	117
Wall flower	56
Wall lake, Sac county	19, 155, 236, 274
Walnut	42, 65, 67, 80, 90, 100, 117, 121, 125, 129, 145, 155, 157, 166, 289
Walnut Grove, Cerro Gordo county.....	100
Walrath, W. H.	17
Wapello county	160, 268
Wapsipinicon river	272
Warbler	97, 252
Ward Brothers	243
Ware, Phil K.	20
Warren county	164
Wa-shood Ne-shun-a-ga-tah, See Cedar river	
Watercress	143
Waterleaf	75, 96
Water lily	80
Waterville, Allamakee county	19
Waugh, (Prof.) Frank A.....	201, 311
Waukon, Allamakee county	19, 106, 218
Waukon-Decorah, Winnebago chief	104
Waukon Sphinx, Jackson county.....	276
Waverly, Bremer county	289
Waxwing	97
Weaver, Henry	268
Webster City, Hamilton county.....	114, 156
Webster county	87, 93
Welsch, (Mr.)	73
Wellman, Charles A.	152
What Bird Conservation Means	253-5
Wheeler, (Mrs.) Walter	143
White oak	42, 45, 65, 67, 74, 79, 89, 121, 129, 145, 152, 155, 159, 166, 177
White mountains	201
White pine	42, 45, 73, 74, 81, 184, 185, 194
White snake root	167
Wick, Barthinius L., lawyer	18
Widgeon	247
Wild Bird Protection in Iowa	244-7
Wildcat Cave and Woodman's Hollow.....	91-2
Wildcat Den, Hardin county.....	19
Wildcat Den, Muscatine county.....	19, 40, 72, 75, 114, 155, 184, 203
Wildcat Glen, See Wildcat Den	
Wildcat Glen, Hardin county	110, 112
Wildler, Frank A., geologist	93, 134
Wild oats	76

	Page
Willett station, Van Buren county.....	70
Willow.....42, 56, 67, 74, 81, 99, 121, 152, 155, 166.	171
Willow creek, Cerro Gordo county.....	273
Wilson, D. O.	163
Wind flower.....46, 57,	89
Winnebago county.....	274
Winnebagoes, Indian tribe.....104,	146
Winneshiek county.....19, 142, 270,	310
Winneshiek, Winnebago chief.....	104
Winona track, Mitchell county.....	144
Winterset, Madison county.....	163
Wire worms.....	257
Wiry drop seed grass.....	53
Women Want Iowa Scenery Preserved.....273,	83
Woodcock.....	252
Wood duck.....	100
Wood lake, Hancock county.....	243
Woodman's Hollow and Wilcat Den.....87, 89,	90
Woodman's Hollow, Webster county.....	203
Worth, Cerro Gordo county.....	168
Wren.....	252
Wright, George G.	62
Wyoming Hill.....	75
Xenia, Hardin county.....	112
Yarrow.....	57
Yellow grass.....	75
Yellow river.....19,	162
Yellow River Region in Allamakee county.....	163
Yellow River Valley North of Postville.....	162
Yellowstone Park, Wyoming.....	201
Yew.....46, 96,	145
Young, Brigham.....	269
Yucca.....	53
Zizia.....	89

LIBRARY OF CONGRESS



00008830381

